the result is bound to be a great struggle between the government and the public on the one side and the labor unions on the other to decide which is the master.

Meantime, however, it is best that we should recognize frankly the fact that conditions such as now exist in the coal mining industry, have real causes: that labor never shows such a spirit of discontent without their being some reason for it; and that while the struggle is going on to prevent organized labor from getting control of government and industry an effort should be made to remedy the conditions which cause so much discontent.

The miners have real reason for being discontented with the conditions of their employment. They are at fault for having attempted to improve their lot in the way they have, but many classes of persons are at fault because of the conditions which have given rise to their discontent. The great irregularity of their employment has been due to irregularity in the operation of the mines. This in turn has been due to wide fluctuations from season to season in the market for coal. Because most coal is consumed in the late fall, winter and early spring months it has been customary to produce it in much larger volume in some seasons of the year than in others. It must continue to be consumed in much larger quantities in some parts of the year than in others, but it would be perfectly feasible for the public, the railroads, and the coal operators to enter into arrangements which would cause a more nearly uniform coal production throughout the year.

Everybody agrees that it is desirable that coal for domestic consumption should be stored in houses and apartment buildings in the spring and early summer, but the public will not buy it at that time unless given an incentive to do so. That incentive should be afforded by the railways making lower rates and the coal operators and dealers making lower prices in the spring and summer than they do in the fall and winter, and then using their utmost efforts to get people to buy at the right time. The railroads, which are the largest consumers of coal, should move and store a much larger part of their supplies than they do now in the spring and summer. Of course, stored coal has to be rehandled, but the cost of rehandling could be offset by the operators making lower prices in the spring and summer than in other parts of the year and by the railroads moving it at that time, when the amount of traffic moving is normally less than at other seasons and when, therefore, the operating expense of moving it would be less than at other seasons. Manufacturers also could buy and store a great deal more coal in the spring and summer months than they have in the past, and probably would do so if they were given the incentive of lower railway rates and lower prices.

The effect of the adoption of these measures would be greatly to reduce the irregularity of employment in the mines, and thereby to reduce the number of miners that would be necessary, and the economic cost of producing and transporting fuel. The reduction of the irregularity of employment would be beneficial to the miners, and the reduction in the cost of production and transportation would be beneficial to all classes of consumers. Why have not these obvious remedies for the entirely unsatisfactory conditions under which coal has been produced and transported been adopted? Because the leaders of the public and the miners, and the leaders in the fields of transportation and mine operation have not seen and admitted that they have had a duty to perform and co-operated in the performance of it.

The strike will be ended sooner or later. When it is ended the plain duty, which the crisis through which we are passing points out, should be performed. Somebody must take the initiative in bringing about its performance. If nobody else takes it the managers of the railways ought to take it. Some people doubtless will say that government officials should take it, but in view of the way that government officials have dealt with the coal strike it seems probable that the less interference there is from them the better the results will be for everybody.

The Cost of British Locomotives

LONDON, Eng., October 19, 1919.

OUR LONDON CONTEMPORARY, the Railway Gazette, in a recent editorial criticises the Egyptian State Railway Administration for spending several thousand pounds for locomotives in America, indicating that the purchases were made without due consideration of prices even though the British concerns quoted prices from 76 per cent to 81 per cent higher than that quoted by the successful American locomotive builder. Its implication was, although they took great pains to forestall any criticism in this respect, that even though the quotations of the British manufacturers were much higher than those of the American manufacturer "the quality of British workmanship and the class of material put into the engines, compared with those produced in other countries, result in an economy in repairs and maintenance and an increased life which more than repay the higher first cost."

The figures quoted as the bids of the British manufacturers were from £15,000 ($63,000)* to £17,000 ($71,400)* with a possible delivery in 1921, as against the American locomotive builder's figures of £8,500 ($35,700)* to £9,400 ($39.500)* with delivery in four months. In other words the Railway Gazette would imply that the workmanship of the British locomotive builders is sufficiently better to warrant the Egyptian State Railways paying from $27,000 (76 per cent) to $32,000 (81 per cent) more a piece for their locomotives. We are well aware that the expense of maintenance and repairs should be as carefully considered as the first cost of an article, but at the same time we also believe that the interest on the investment is as important a factor as the cost of maintenance. Figuring money at five per cent, which is an exceedingly conservative rate at the present time, had the Egyptian State Railways purchased their locomotives from the British manufacturers at the quoted figures they would have had additional yearly capital charges varying from $1,400 to $1,600 to apply to each one of these engines.

Before the war, the manufacturers in Great Britain were in a particularly advantageous position as regards the cost of labor. They could economically put more labor in their manufactured articles and produce a product of greater refinement at a much lower cost than was possible in the United States. At the same time the low cost of labor made unnecessary the development and use of so-called labor saving machinery. During and since the war, however, the cost of labor has increased in Great Britain to such an extent that the cost of the final product when made according to pre-war practice, is greatly increased. America on the other hand having had to carefully watch its labor cost has constantly improved its manufacturing methods by the installation of inproved machinery and on the other hand has found it impractical and uneconomical, in the final analysis, to go to the refinement of the British manufacturers.

The real lesson to be learned from the fact that the colonies of Great Britain can buy so much cheaper from America is that greater development has been made in America in the use of improved machinery. It has been repeatedly stated by careful students in manufacturing costs that with the greatly increased cost of labor both Great

*Based on an exchange rate of $4.20.

the result is bound to be a great struggle between the government and the public on the one side and the labor unions on the other to decide which is the master.

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Britain and many of the European countries will find it increasingly necessary to improve their manufacturing methods and to use more modern labor saving machinery than they have in the past.

The Salaries of Railway Officers

REPRESENTATIVE SIMS has rendered a real service to railway officers, the railways and the public by publishing in the Congressional Record a list of the salaries amounting to $20,00 or more, which were paid by the railway companies in 1917, the last year of private operation. This list was given in the delayed issue of the *Railway Age* for October 10, which was published on November 26

There has been much talk for years about the "fancy" salaries paid by the railways. What has been said on this subject has led many persons to believe that the large salaries were so numerous and excessive as to result in "exploitation" of employees, stockholders and public. Doubtless the large salaries paid in 1917 were larger, and there were more of them than ever before. It is, therefore, interesting and instructive to find how few really large salaries were paid and what a trifling sum they aggregated in comparison with the total earnings, expenses and pay roll of the roads.

There were about 20,000 general and divisional officers in 1917. The list published in the Congressional Record shows that just 200, or about 1 per cent of these, received $20,000 or more. The aggregate amount paid to these 200 officers was $6,644,074. This was $16 out of each $10,000 of the total earnings of the roads; $24 out of each $10,000 of their operating expenses, and $31 of each $10,000 that they paid out in salaries and wages. The amount was so small that if instead of having been paid to the officers it had been divided between the employees the average employee would have received less than $4 a year more than he actually did. The aggregate salaries of all those receiving $50,000 or more were less than $1,900,000. This amount, if divided between the employees, would have added less than $1.25 to their average wages for the year.

It may be asked, however, why this many salaries ranging from $20,000 to $100,000 a year were paid? There are two answers: First, bidding among the railway companies themselves for the best brains in the business has placed a premium upon those brains and this premium is represented by the salaries paid to the principal officers. Second, the railways have had to bid for brains against other industries. It has been no uncommon thing for men of ability to leave the railroad business in order to secure in other lines of business incomes larger than they could get in the railroad business. If the railroad companies did not pay high salaries to men of first-class ability most of the men of first-class ability in the industry would be attracted away to positions in other fields.

While to a man who is receiving an income of perhaps $1,000 or $2,000 a year salaries of $20,000 to $100,000 may seem very large, the fact is that the incomes which railway officers have enjoyed in proportion to the amount of energy and ability they have devoted to their work have been much smaller than the incomes made by men of corresponding rank in other lines of industry. While it is very unusual for a railway officer to receive a salary of $75,000 a year, it is by no means unusual for men in purely industrial and commercial businesses to make incomes largely exceeding this amount. In fact, there are thousands of men running small businesses in the country in which they own substantial amounts of stock, who are receiving salaries and dividends ranging anywhere from $100,000 to $1,000,000 a year. We know of the case of a railway president who a very few years ago refused a salary of $250,000 a year as head of a large manufacturing concern. We know of two cases of railway officers of lower rank than that of president who very recently became the heads of large industrial concerns under arrangements which will yield them larger incomes than that received by any of the railway officers whose names appeared in the list published in the Congressional Record. It is the misfortune of a man of ability in the railroad field that he has to depend for his income almost entirely upon his salary, because in the railway field the opportunities for making profitable investments are much more restricted than in almost any important line of commerce or industry.

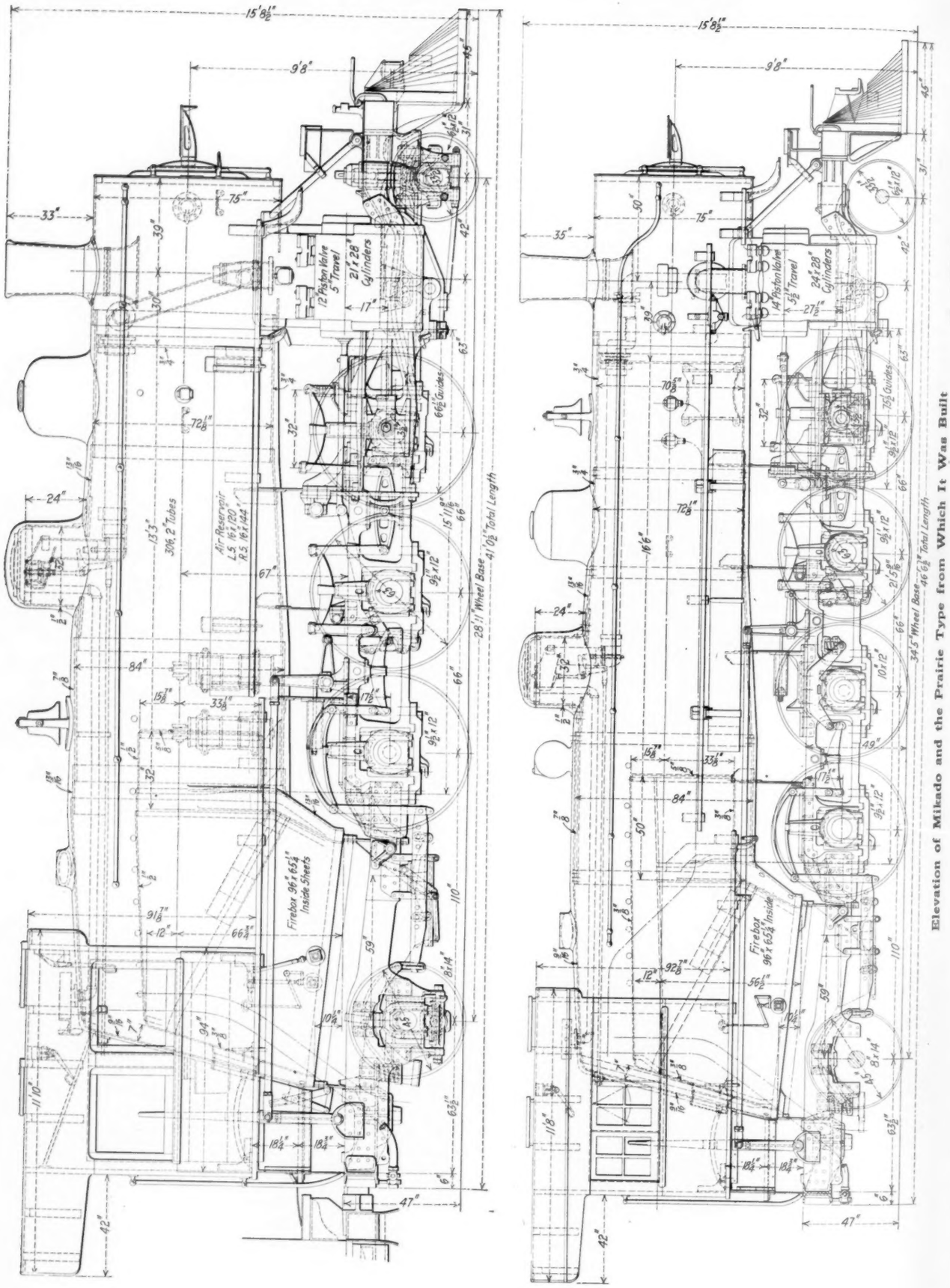
A certain newspaper, in commenting upon this list of salaries of railway officers, remarked that it was adapted to increase the sentiment for government ownership among railway employees, because it would make them feel more sharply the difference between their incomes and those of the higher officers. As a matter of fact a very large majority of the men receiving large salaries on railways have risen from the ranks of the employees. The number of individual officers receiving $50,000 or more whose names appeared in this list is 29. The following list gives the positions in which and the ages at which 18 of these 29 men entered railway service:

R. H. Aishton, axman, 18 years old,
W. G. Besler, trainmaster's clerk, 16 years old,
H. E. Byram, call boy, 16 years old,
A. J. Earling, telegraph operator, 17 years old,
J. M. Hannaford, clerk in general freight office, 16 years old,
Walker D. Hines, attorney, 23 years old,
Marvin Hughitt, telegraph operator, 19 years old,
L. E. Johnson, fireman, 20 years old,
E. F. Kearney, telegraph operator, 17 years old,
J. Kruttschnitt, engineering department, 24 years old,
L. F. Loree, assistant in engineering corps, 19 years old,
R. S. Lovett, local attorney, 24 years old,
W. T. Noonan, employee in accounting department, 14 years old,
Edmund Pennington, warehouseman and brakeman, 21 years old,
Samuel Rea, engineering corps, 16 years old,
E. P. Ripley, contracting freight agent, 23 years old,
T. M. Schumacher, telegraph operator, 17 years old,
W. H. Truesdale, clerk, 18 years old.

A. H. Smith, William Sproule and F. D. Underwood have modestly rendered it impracticable for us to ascertain offhand how old they were when they entered railway service, but Mr. Smith entered it as a foreman of bridges, Mr. Sproule as a clerk, and Mr. Underwood as a clerk, who soon graduated into a brakeman.

It will be noted that a large majority of these high-salaried men entered railway service when they were mere boys; and most of them had been continuously in the service for more than 30 years before they became heads of railroads and began to draw really large salaries. When it is considered that the 200 men included in the list as receiving $20,000 or more were the principal officers and managers of properties representing an investment of approximately $19,000,000,000 and having earnings of over $4,000,000,000 a year and operating expenses of almost $3,000,000,000 a year, it is rather difficult to understand how anybody having any knowledge of the character of the work they had to do and the responsibilities they had to carry can say that they were paid too much.

Furthermore, since a very large majority of them rose from the ranks, it would seem that the larger were the salaries paid to them the greater would be the incentives afforded to the ambitious men in the service to strive, by increasing their efficiency, to increase their chances of rising to the highest positions.



Elevation of Mikado and the Prairie Type from Which It Was Built

Northern Pacific Converts Prairie Type to Mikado

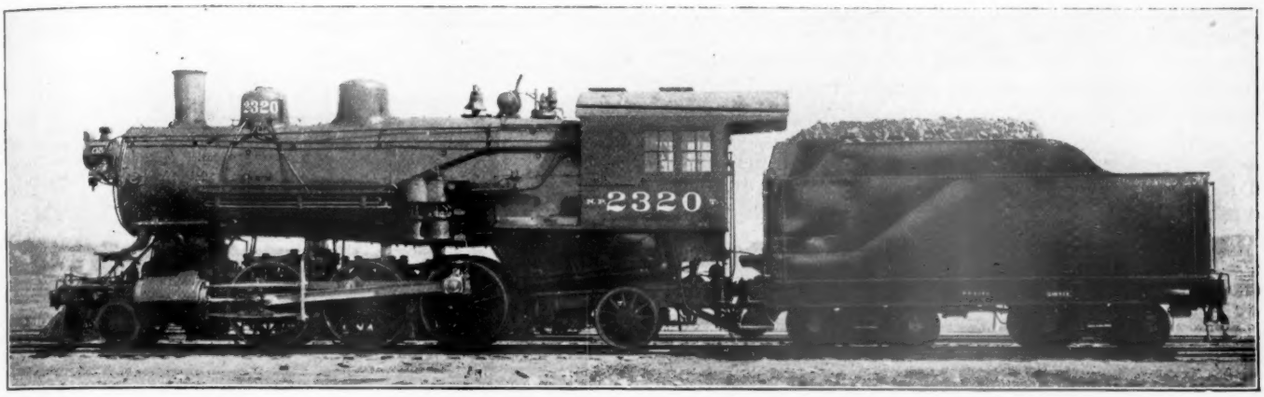
Increased Tractive Effort and More Efficient Use of Fuel Secured by Changing Old Power

THE RECONSTRUCTION of a Prairie type locomotive to the Mikado type, with a consequent increase of 21 per cent in the tractive effort and a substantial improvement in the efficiency of the boiler and cylinders, has recently been effected on the Northern Pacific. The details of this work are of particular interest as illustrating how motive power which is no longer suitable for heavy service can be redesigned to increase the train load and decrease the unit consumption of fuel. The changes that were made not only raised the tractive effort but also improved the steaming qualities of the locomotive, so that an even greater increase in the train load was secured.

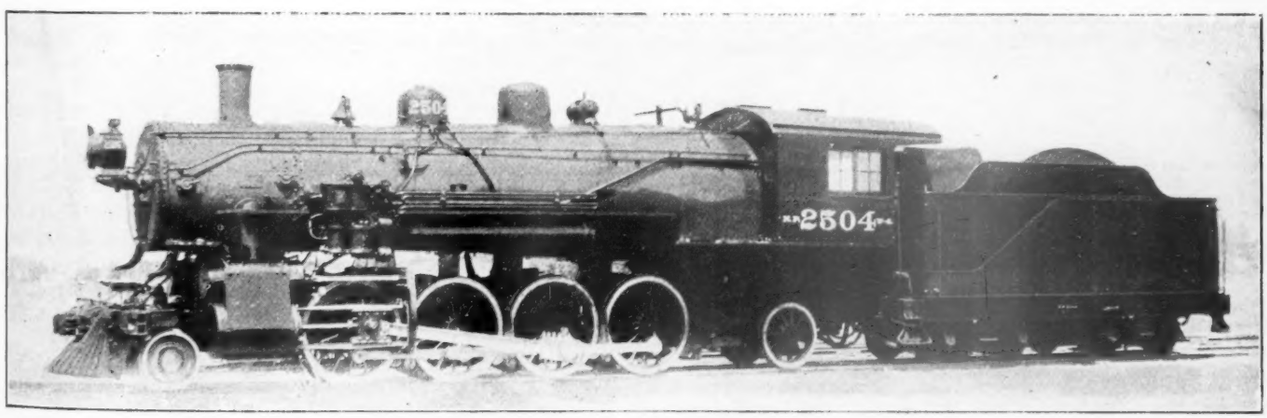
The reconstructed locomotives were intended for use between Glendive and Billings, Mont. On this division the heaviest grade is opposing the westbound movement, the ruling gradient being 26 ft. per mile. In this direction the rating of the Prairie type, or class T, which has a rated tractive effort of 33,300 lb. is 1,600 tons, while the rating for the Mikado, class W-4 with 40,300 lb. rated tractive effort is 2,600 tons, an increase of 62 per cent. On the eastbound movement the rating is controlled by the passing siding, the ratings for the two types being as follows: From Billings to Forsyth, class T, 2,900 tons, class W-4, 3,400 tons; from Forsyth to Glendive, class T, 2,800 tons, class W-4, 3,300 tons.

An additional advantage secured by the conversion to the Mikado type is uniformity of train loads on several divisions. The heavier Mikados in use on the Northern Pacific have tractive efforts of 46,000 lb. and 57,100 lb. and, in connection with the class T and class W-4, provide motive power units adapted for hauling approximately equal tonnage on lines with grades that vary widely, thus facilitating through movement without breaking up trains at division points.

The class T Prairie locomotives which were rebuilt were purchased in 1906. The weight on drivers was 153,500 lb. and the total weight of the engine 204,500 lb. The new class W-4 Mikado weighs 204,000 lb. on drivers, with a total weight of 249,000 lb. It will be noted that in making the change, the weight per driving axle remains substantially the same and, by the addition of the fourth pair of wheels, the weight on drivers was increased in a greater ratio than the tractive effort. The 21 in. by 28 in. cylinders were replaced by cylinders 24 in. by 28 in. with 14 in. piston valves and outside steam pipes. To provide ample steaming capacity for the larger cylinders, the size of the boiler was increased and a superheater was added. The grate area was not changed and no alterations were made in the brick arch. The boiler barrel was lengthened 57 in. by adding a new front course. This was utilized by increasing the distance between the tube sheets, making the tubes and



Northern Pacific Prairie Type Locomotive, Class T



Mikado Type, Class W-4, Rebuilt from Class T

Elevation of Mikado and the Prairie Type from Which It Was Built

flues 16 ft. 6 in. long, and by increasing the length of the combustion chamber from 32 in. to 50 in. The increase in the length of the frame to provide for the fourth wheel was 66 in. The additional space of 9 in. was taken up by the increased length of the smokebox from the center line of the stack to the first ring of the boiler which was necessary to provide room for the superheater header. The length of the smokebox ahead of the cylinder center was also increased from 39 in. to 50 in. The change in the boiler and the application of the superheater increased the equivalent heating surface from 2,359 sq. ft. to 3,186 sq. ft. or 35 per cent.

The frames were replaced with new cast steel frames of larger section. The uniform spacing of 66 in. between driving wheels was retained, thus reducing the number of new parts required. A heavy cast steel crossbrace was added over the main driving axle. In redesigning the running gear no radical changes were necessary. The engines as originally built had a short rigid wheel base and the distance from the cylinder to the front axle was unusually short for locomotives of the Prairie type, making it necessary to couple the main rod to the rear driving wheel. For this reason, the distance from the transverse center line of the cylinders to the center line of the front drivers was maintained unchanged in the new design, making it possible to use the same spring rigging on the Mikado with the addition of equalizers for the main drivers. The equalizing system, as before, is divided between the second and third wheels.

In order to provide for the increased stresses due to the larger cylinders, the axle of the main wheel was made 10 in. in diameter. The piston rod was lengthened 3½ in. and the main rod was shortened a corresponding amount. The valve gear was changed by substituting an indirect for a direct rocker arm, the travel being increased from 5 in. to 5½ in.

The improvements in the smokebox were designed to overcome the trouble of throwing sparks. With the class T engines this has been very annoying in the past, particularly when used in the district where semi-bituminous coal is burned.

The converted engines ride much easier than the Prairie type and, because of the better load distribution, are much easier on the track.

For the purpose of comparison, the principal weights, dimensions and ratios of the two types are tabulated below:

	Class T 2-6-2	Class W-4 2-8-2
General Data		
Gage	4 ft. 8½ in.	4 ft. 8½ in.
Service	Freight	Freight
Fuel	Bit. coal	Bit. coal
Tractive effort	33,300 lb.	40,300 lb.
Weight in working order	204,500 lb.	249,000 lb.
Weight on drivers	153,500 lb.	204,000 lb.
Weight on leading truck	20,500 lb.	19,600 lb.
Weight on trailing truck	30,500 lb.	25,400 lb.
Weight of engine and tender in working order	353,000 lb.	397,500 lb.
Wheel base, driving	11 ft. 0 in.	16 ft. 6 in.
Wheel base, total	28 ft. 11 in.	34 ft. 5 in.
Wheel base, engine and tender	57 ft. 3½ in.	62 ft. 9½ in.
Ratios		
Weight on drivers ÷ tractive effort	4.61	5.06
Total weight ÷ tractive effort	6.14	6.18
Tractive effort × diam. drivers ÷ equivalent heating surface*	889.3	796.9
Equivalent heating surface* ÷ grate area	54.2	73.2
Firebox heating surface ÷ equivalent heating surface,* per cent	10.0	8.15
Weight on drivers ÷ equivalent heating surface*	65.1	64.0
Total weight ÷ equivalent heating surface*	86.7	78.2
Volume both cylinders	11.20 cu. ft.	14.62 cu. ft.
Equivalent heating surface* ÷ vol. cylinders	210.6	217.9
Grate area ÷ vol. cylinders	3.88	2.98
Cylinders		
Kind	Simple	Simple
Diameter and stroke	21 in. by 28 in.	24 in by 28 in.
Valves		
Kind	Piston	Piston
Diameter	12 in.	14 in.
Greatest travel	5 in.	5½ in.
Outside lap	1 in.	1 in.
Inside clearance	0 in.	0
Lead in full gear	1/32 in. neg.	1/32 in.
Wheels		
Driving, diameter over tires	63 in.	63 in.
Driving, thickness of tires	3½ in.	3½ in.
Driving journals, main, diameter and length	9½ in. by 12 in.	10 in. by 12 in.
Driving journals, others, diameter and length	9½ in by 12 in.	9½ in. by 12 in.
Engine truck wheels, diameter	33½ in.	33½ in.
Engine truck journals	6½ in. by 12 in.	6½ in. by 12 in.
Trailing truck wheels, diameter	45 in.	45 in.
Trailing truck journals	8 in. by 14 in.	8 in. by 12 in.
Boiler		
Style	Ext. Wagon Top	Ext. Wag. Top.
Working pressure	200 lb. per sq. in.	185 lb. per sq. in.
Outside diameter of first ring	72⅛ in.	70⅝ in
Firebox, length and width	96 in. by 65¼ in.	96 in. by 65¼ in.
Firebox, plates, thickness	Door, crown and sides ⅜ in.; tubes ⅝ in.	Door, crown and sides ⅜ in., tubes ⅝ in.
Firebox, water space	Front 4½ in., back and sides 4 in.	4½ in. and 4 in.
Tubes, number and outside diameter	306-2 in.	173-2 in.
Flues, number and outside diameter		28-5⅜ in.
Tubes and flues, length	13 ft. 3 in.	16 ft. 6 in.
Heating surface, tubes and flues	2124 sq. ft.	2138 sq. ft.
Heating surface, firebox	235 sq. ft.	259 sq. ft.
Heating surface, total	2359 sq. ft.	2399 sq. ft.
Superheater heating surface		526 sq. ft.
Equivalent heating surface*	2359 sq. ft.	3186 sq. ft.
Grate area	43.5 sq. ft.	43.5 sq. ft.
Tender		
Tank	Rectangular	Rectangular
Journals, diameter and length	5½ in. by 10 in.	5½ in. by 10 in.
Water capacity	8000 gal.	8000 gal.
Coal capacity	12 tons	12 tons

* Equivalent heatting surface = total evaporative heating surface + 1.5 times the superheating surface.

Orders of the Regional Directors

OIL IN TRAIN LOADS.—Order 248, of the Southwestern regional director cancels the instructions in Order 211 stipulating that 20 or more cars of oil for one destination, distributing center or junction would be symbolled, reported and handled as a trainload.

Clergy Tickets.—Order 246 of the Southwestern regional director modifies current instructions governing the issuance of half fare clergy tickets. Ticket sellers must punch each ticket, coupon and contract "one-half," and stamp thereon "Clergy." Federal auditors must see that tickets and coupons punched "one-half," are checked against local or interline reports, and call attention of reporting carriers to all tickets reported at one-half fare, where coupons are found not punched and stamped.

Export Bills of Lading.—Supplement 2 to Circular 248 Southwestern Region, contains instructions for the distribution of the 11 copies which should be made of all through export bills of lading.

Fires Resulting from Derailments.—Supplement 2 to Circular 189 of the Southwestern regional director calls attention to recent derailments in which loaded oil tank cars caught fire resulting in damage of $6,380, and points out the necessity for observing certain precautions prescribed by the Bureau of Explosives.

Vacations for Train Despatchers.—Supplement 14 to Circular 28 of the Northwestern regional director contains rules and regulations regarding rates of pay and vacations for train despatchers adopted at a recent meeting of regional directors in Chicago, with W. T. Tyler, director of the Division of Operation. These rules were effective on October 1.

Through Bills of Lading Via North Atlantic Ports.—Circular 282, canceling Circular 277, of the Central Western regional director contains instructions governing the issuance of through export bills of lading via North Atlantic Ports which supersede all previous instructions. The Southwestern regional issues similar instructions in Circular 2521.

The Coal Strike and the Railroads

Coal Necessary to the Operation of Railroads and Railroads Necessary to Distribute Coal to Consumers

DIRECTOR GENERAL HINES on December 6 authorized the following statement:

"The shortage of coal has reached a point where it is vitally necessary to reduce passenger train service and to call upon the public to assume the inconvenience and discomfort which this action will inevitably entail.

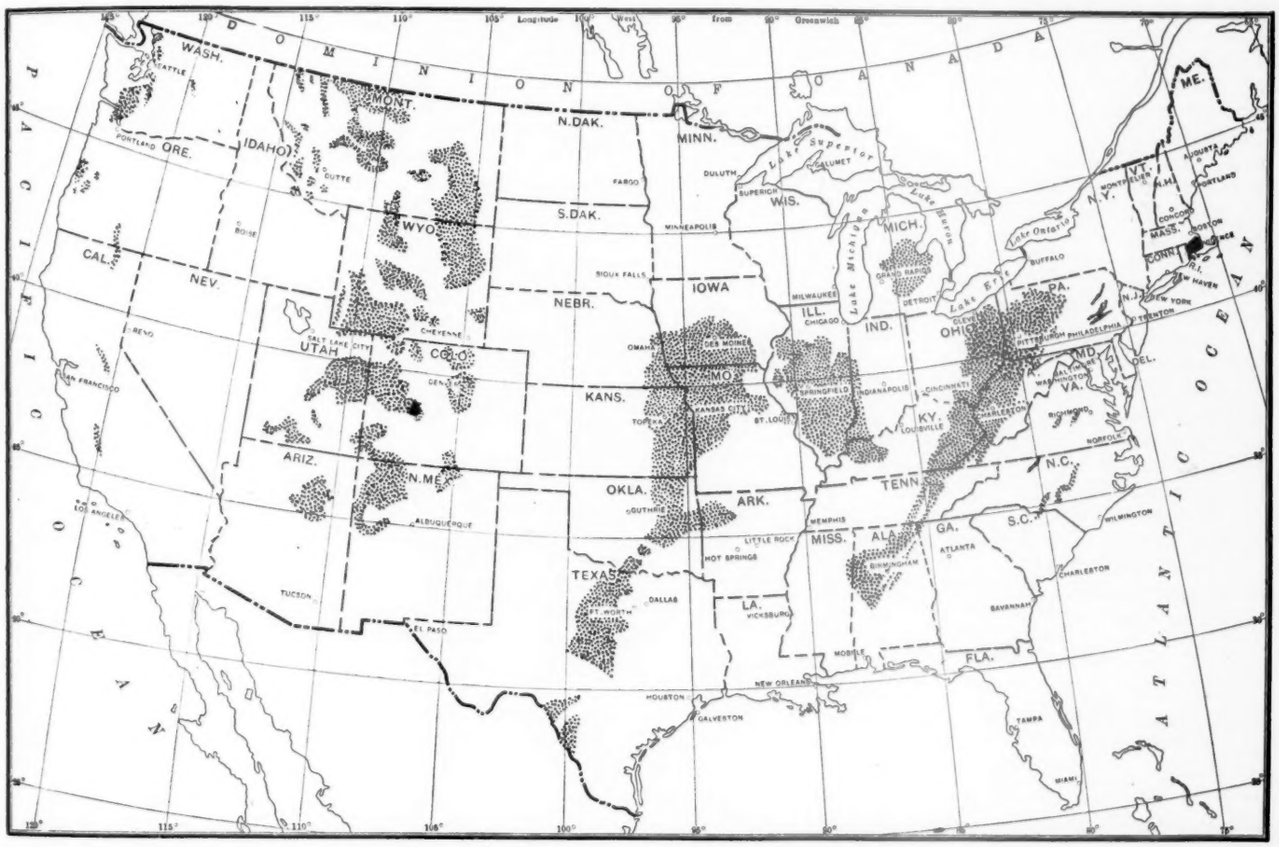
"On Monday, December 8, in the Western regions; Tuesday, December 9, in the Southeastern regions, and Wednesday, December 10, in the Eastern and Allegheny regions, certain passenger trains will be annulled and a large number of parlor cars will temporarily be discontinued. The average seating capacity of a parlor car is less than half the average seating capacity of a coach, and this step is taken for the purpose of providing the maximum seating capacity consistent with the necessary reduction in train mileage. These changes are being worked out in detail by the regional directors, and promptly upon their completion will be given wide publicity. Before making arrangements for travel inquiry should be made of railroad agents as to available trains.

"It is the plain duty of the administration to warn the public that until this emergency has passed travel conditions will be difficult and unsatisfactory, and to urge everyone who can possibly do so to refrain from travelling.

"It is unfortunate that the emergency comes as the holiday season approaches, but it is hoped and believed that our people will appreciate the gravity of the situation and will give full and cheerful co-operation."

The railroads of the country under present conditions consume about 30 per cent of the total output of bituminous coal of the United States. The strike has reduced coal production to about 40 per cent of the normal production at this time of year. The railroads head the list of the industries to which priority in coal deliveries are to be allowed. Were they, therefore, to continue to consume as much coal as heretofore but 10 per cent of the total normal production would be left for the domestic consumers and for industries in general. They will not, however, continue to consume their full quota. In the first place, bituminous coal as a commodity carried by railroads furnishes about 27 per cent of the total tonnage of freight carried by all the railroads of the country. Were the tonnage of coal carried to industries therefore to be cut down to one-seventh of normal a very considerable part—varying from 15 to 20 per cent—of freight service would automatically cease. Furthermore, as soon as industries begin to shut down on account of shortage of coal a large part of freight traffic other than coal would also cease to flow.

The problem, therefore, for the railroads is to themselves consume as little coal as possible while continuing to deliver as large an amount as possible to domestic consumers and to industries. Obviously the first step is reduction in



The Principal Coal Fields of the United States. Bituminous Fields Shown Shaded and Anthracite Shown Black

passenger train mileage. The administration has announced a general cut in passenger train service.

The aim in the Eastern region is to reduce passenger train mileage 10 per cent. The Twentieth Century Limited is to be taken off, as is also, in the Allegheny region, the Pennsylvania's 20-hour train, the Broadway Limited. In the West the reduction is more drastic.

A reduction of even 10 per cent in passenger train mileage over the entire country would mean a saving of 57,500,000 passenger train miles a year, or a saving, roughly, of 10,000 tons of coal per day, making a rough allowance for the continuance of full service on roads burning oil for fuel.

The Director General Takes Control of Coal

On October 31 Director General Hines issued an order by which the Railroad Administration took control of all coal in the possession of the railroads. The order said: "The title of the purchaser, consignee or consumer, in the case of any such shipments of coal or coke, which by custom or law might become vested at the time and place of such shipment, shall, from and after the effective date hereof, be subject to the condition that the coal or coke so shipped may be diverted . . . the title and interest of such purchaser . . . shall be completely divested and terminated, and his liability to pay therefor shall cease. The person or the consumer to whom any such coal or coke is diverted shall become liable, as of the time of such diversion to pay the shipper thereof the price in force at the date of shipment . . . plus transportation charges and a handling charge of 15 cents a net ton. . . ."

On November 4 the following order of priority was fixed:

(Class A) Railroads—This includes inland and coastwise vessels.

(Class B) army and navy, together with other departments of the federal government—This includes bituminous coal consumed by manufacturers or producers of supplies for departments of the federal government when such department officially approves the request.

(Class C) State and county departments and institutions—This includes municipal institutions.

(Class D) Public utilities—This includes the manufacture of newsprint paper for daily issue and the printing and publishing of same."

Coal Operators' Difficulties

This order threw on the coal operators the burden of financing all the coal that they produced and shipped for an indefinite period. The Railroad Administration took over the coal as soon as it was loaded into railroad cars. No payment was made to the operator, nor could the operator bill anyone for this coal, since its disposition was fixed by the Railroad Administration. The coal operators claim that the sum involved is very large indeed and that the period over which they may have to carry an unknown purchaser is likely to be as much as six months. To remedy this situation the Railroad Administration proposed to issue a receipt for the coal, which the operators could discount at their banks and which their banks could discount with the federal reserve bank.

The Secretary of the Treasury, however, has held that the coal operators can now draw a note to cover their shipments of coal and that this note can be discounted with their own banks and rediscounted at the federal reserve banks without attaching to it a receipt for the coal delivered to the Railroad Administration. This, however, throws the burden of financing back on the individual operators. They are using their credit to finance the purchase of coal by unknown parties. They claim, therefore, that since the Railroad Administration—the government—takes title to the coal as soon as it is put into railroad cars the administration or some other branch of the government should pay the operators and undertake collection from those to whom the Railroad Administration delivers the coal.

The Situation in the East

On the Pennsylvania Railroad the average loading of bituminous coal before the strike was 38,000 cars daily. The minimum so far has been 1,491 cars daily, and the present loading (December 5) is 19,000 cars daily. On the Baltimore & Ohio, Eastern Lines, the average daily loading from May to October was 2,117 cars daily. In November the average was 1,204 daily, and the average loadings in the first three days of December was 1,421 cars. On the Baltimore & Ohio, Western Lines, the average daily loadings prior to the strike were 627 cars. This dropped to no loadings at all for some days, and the average loadings since November 1 to December 4 have been but 7 cars a day.

In the Ohio-Indiana region the average daily loadings amounted to 2,740 cars during October, dropped to an average of 144 cars in November and averaged 83 cars in the first three days of December.

In the Pocahontas region the average before the strike was 4,874 cars loaded, and on November 4 this had dropped to 3,250 cars. On November 12 3,897 cars were loaded, and on November 25 the record was 5,216 cars loaded; the present rate of loading is about 4,393 cars.

Situation in the West

A conference was held in Chicago on December 3, in which Hale Holden, regional director of the Central Western region; F. E. Clarity, assistant regional director of the Central Western region; P. S. Eustis, chairman of the passenger traffic committee of the Northwestern, Central Western and Southwestern regions, and M. J. Gormley, assistant regional director of the Northwestern region, participated. As a result of the discussion it was agreed that Mr. Eustis should draw up the requirements for the curtailment of passenger traffic and the resulting orders should be issued simultaneously in the Central Western, Southwestern and Northwestern regions.

The order as prepared by Mr. Eustis, in general, calls for a reduction in passenger service on lines using coal for fuel of at least one-third in train miles, eliminating those passenger trains which can be spared with the least inconvenience to the traveling public. At the same time the order calls for the abolition of practically every train luxury calculated to increase coal consumption.

The regulations as prepared by Mr. Eustis and distributed from the three regional offices are as follows:

(1) Effective at 12:01 a. m. Monday, December 8, the existing regular passenger train service using coal for fuel must be reduced on your road at least one-third in train miles, eliminating those passenger trains which can be spared with the least inconvenience to the traveling public.

(2) Discontinue all parlor cars, and also all exclusive club and lounge cars. Also withdraw from service all observation sleeping cars where the result is to save any switch engine service, provided you can obtain for substitution sleeping cars of regular type where necessary.

(3) No special trains are to be run for business or pleasure traffic.

(4) There must be no second sections of regular trains. Business must be cared for by adding extra cars, but not beyond the prescribed limit, and by lengthening the schedules of existing trains. When capacity of regular trains is reached, overflow of travel will of necessity wait over or seek carriage elsewhere.

(5) Exclusive mail and express trains need not be reduced in number, but no additional trains nor extra sections may be run for such traffic. The prospective heavy business to be cared for by adding extra cars to and lengthening the schedules of existing trains.

(6) Care must be used to give publicity as early as possible

to changes in your train service. This may be done by paid advertisements in the press and by bulletin notices in stations in such manner as you decide. Keep all ticket agents fully advised that the public may obtain information on application.

(7) It has been arranged to keep all consolidated ticket offices and passenger departments posted as to reductions, but you should also fully inform your immediate connections of changes.

(8) The Western Passenger Committee will, by general notice through press associations and by advertisement in some large cities, advise the public of intended curtailment of service, with the request that people abstain from unnecessary travel. Please have your officers and agents supplement and emphasize this plea as quickly as possible.

It is believed that, by thus conserving the use of coal which would ordinarily be used in passenger service, extensive embargoes on freight traffic will not be necessary. It is also true, on the other hand, that if the present shortage continues it will be practically impossible to carry out even this program for passenger service for any length of time, and it may be necessary to extend the curtailment of service to freight traffic as well.

Although suffering a heavy loss in coal traffic because of the cessation of mining operations, the railroads in the Northwestern and Central Western regions have felt practically no other direct effect of the coal strike until the last few days. While some of the roads curtailed passenger train service several weeks ago, these measures were initiated more for the purpose of preparing well in advance to meet the inevitable fuel shortage than because of any immediate necessity at that time for a reduction in fuel consumption. The roads in the Northwestern region have now loaded practically all of their reserve supply and little more than two or three days' supply is in sight. This led to the drastic orders referred to above.

The Northwestern Region

Generally speaking, the territory tributary to the lines of the Northwestern region is not coal-producing, the figures for 1917 production indicating that less than 3 per cent of the total bituminous coal production of the country came from that territory. The coal mined is mostly lignite, and in some of the fields a large percentage of it is used by the railroads. A comparison of classified traffic figures for the months of November, 1919 and 1918, respectively, show an increase of 8 per cent in the number of car loads of coal and coke originating on the Northwestern roads in 1919, with a similar increase of 7 per cent in the total number of car loads of freight originating on these lines and an increase of about 5 per cent in the total number of revenue cars handled, including that originating in the regio and received from connections. This increase in coal-loading during the month of November, 1919, that is, during the period affected by the strike, has been due to the large amount of Eastern coal loaded from storage at the head of the lakes.

The principal mining districts in the Northwestern region are in Washington, Montana and Iowa, the latter territory also being tributary to the railroads in the Central Western region. The Montana and Washington lignite mines are closed tight, with the result that the railroads in this territory have been forced to supply the divisions depending upon these fields with coal received from the East. The result has been an additional long haul and the further depletion of reserves stored at the lake ports.

The railroads in the Northwestern region draw heavily on the Illinois field for their coal supply, and this source has been shut off entirely throughout the period of the strike. This has been made up by a heavy draft on the coal received at the lake ports by such roads as the Northern Pacific, the Great Northern and the Soo Line and accounts for the increased loading of coal and coke shown by the railroads in the Northwestern region during the month of November, 1919, as compared with November, 1918. That the winter's supply of coal received at lake ports during the summer and fall has been depleted for immediate use is indicated by the fact that the coal loading of the Great Northern has increased from 6,049 cars in November, 1918, to 9,328 cars in 1919; the Northern Pacific from 12,451 cars in November, 1918, to 17,653 in 1919, and the Soo Line from 2,179 cars in November, 1918, to 4,503 in 1919. The total coal loading for the region was 57,217 cars in November, 1919, as compared with 52,813 for November, 1918.

Central Western Region

The territory through which the Central Western railroads operate produced approximately 20 per cent of the bituminous coal mined in the United States in 1917, but a number of the more important western fields are not served exclusively by the railroads in this region, the traffic being divided between Central Western, Southern and Southwestern lines. In general, in spite of the severe curtailment in coal production in this region during the month of November, there has been only a slight reduction in the total amount of traffic handled. This is accounted for by an increase in general merchandise freight, which may be due to an attempt on the part of the consumers to provide against the contingency of a curtailment of transportation should the coal strike continue. The principal exception to this is the Chicago & Eastern Illinois, on which there has been a 45 per cent decrease in traffic, due to the coal strike.

Some coal is now being produced in the central western territory. The Utah, Wyoming and Colorado mines, which normally produce about 5,000 cars a day, are now producing 1,000 cars daily. The Wyoming field, which was closed by the strike, is now in partial operation. The mines along the Union Pacific, which have successively been closed and placed in operation several times since the strike was called, are now closed. The Illinois field, which produces half of all the coal originating on central western lines, is now and has been closed tight throughout the period of the strike.

While the operation of the roads, with the exceptions above noted, has been normal up to the present time, reserves have now been reduced so that there is not more than two or three days' supply in sight.

General Situation

The annual capacity of the bituminous coal mines is estimated at 700,000,000 net tons. The production in 1917 was 551,000,000, and in 1918 it was 579,000,000. The production from January 1 to November 1, 1919, was 404,040,000, as compared with 504,339,000 during the corresponding period of 1918, according to the Geological Survey report of November 8, which said that, bearing in mind the great decline in consumption following the armistice, it is believed that the stocks now in the hands of consumers compare favorably with those at the same season in previous years.

The railroads had on hand, on wheels and in storage, on November 1 about 22,000,000 tons (439,000 cars) of soft coal, and on December 4 it was 265,000 cars, or nearly a month's supply, and they expect to be able to maintain that amount. From November 6 to November 9 2,655,300 tons were released by the railroads to consumers other than railroads, which was 1,213,200 tons more than the amount loaded in the same period. On the day the strike order was officially called off the railroads had on hand about 15,000,000 tons, or about a 30-day supply. On December 31, 1917, when the railroads were taken over by the government, the stocks on hand in storage amounted to 9,000,000 tons. On July 1 of this year they had about 12,500,000 tons in storage. During the first week of the strike the average carloading of bituminous was 26 per cent of the pre-strike

average, and the second week it was 30 per cent; the third week it was nearly 40 per cent; on December 1 it was 40 per cent; on December 2, it was 42 per cent; on December 3, it was 43 per cent, and on one day recently it reached 48 per cent.

The total tonnage of bituminous coal transported by the railroads in 1917 was 631,0000,000 tons. This, of course, includes duplications where it was handled by more than one railroad. The tonnage originating on road was 355,873,000 tons.

The strike does not seem to be reducing railroad earnings materially as yet, because traffic that was held back by car shortage is taking the place of coal. Operating expenses in the latter part of October were increased by the extraordinary shifting of open-top equipment in order to furnish the maximum number of cars to be loaded with coal in the two weeks immediately preceding the strike and in the effort to give 100 per cent car supply. There is also an extraordinary movement of coal cars, and many are kept empty near the mines so as to be ready for use at once. The decrease in coal traffic, however, has relieved the condition of car shortage which existed up to the middle of October, and has enabled the railroads to handle practically all of the coal offered, which they were not able to do for a time before the strike. It has also released open-top cars for other traffic, which in turn released some box cars for other traffic, such as grain, that can be handled only in box cars.

As to the effect on the movement of freight traffic, the ton mileage handled in October showed an increase for the first time this year since January, and was greater than for October, 1918 and 1917. November traffic was also affected to some extent by the steel strike, and December traffic will be still further reduced by the loss of steel tonnage because of the shortage of coal and coke for the steel plants. The use of coal for coking has been cut down by 25 per cent.

On December 6 an embargo was issued, effective Monday, December 8, against the shipment of fuel oil from the west to points east of the Illinois-Indiana state line and north of the Ohio river, except on permits issued by W. L. Barnes, assistant manager, Car Service Section, Chicago, who will give permits for industries that have used fuel oil before November 1, or for export. The object is to avoid the eastward shipment of fuel oil that might be used in the west to avoid the westbound shipment of coal, on the theory that new users of oil should be those located in the west, where there is no coal, rather than in the east where the coal is.

There have been some newspaper statements that the Railroad Administration was trying to get its coal now at a lower price than others and that it has had a lot of coal standing around that it refuses to let go of. It has deliberately tried to build up and keep a reserve which could be used for the most essential purposes, as coal has been consumed faster than it has been mined.

During the month of November the Railroad Administration delivered to essential consumers other than railroads a quantity of coal equal to the entire tonnage mined during the month—that is, the railroads used up some of their own reserve stocks.

The railroads are now paying the full government prices for coal under the orders re-established on November 1, which represents a considerable increase, as they have been getting coal during the year at prices considerably less than the fixed prices which they paid last year.

Lieut.-Gov. Oglesby of Illinois and other representatives of the governor called on Mr. Hines December 6 to urge an increase in coal shipments to Chicago and Illinois. After they had explained the situation to the Central Coal Committee it was arranged to place additional orders for 1,500 cars a day to the Central Western and Northwestern regions, from which 500 cars will go to the Chicago district and 600 cars to Illinois outside of Chicago.

On December 6 Fuel Administrator Garfield issued an order extending the previous orders regarding the fixing of prices and the allocation of coal to apply to beehive or by-product coke.

End of Coal Strike Expected

Prospects for the ending of the bituminous coal strike this week appeared certain Saturday night, December 7, when John L. Lewis, acting president, and William Green, secretary-treasurer of the United Mine Workers, agreed to urge the acceptance by the miners of a "definite, concrete proposition" from the President "looking to a speedy termination of the strike situation and an adjustment of the entire controversy," placed before them during the day at a conference at the office of the attorney general, who had earlier in the day conferred with the President. The officers of the miners' union, faced with prosecution in contempt of proceedings for violation of the Indianapolis injunction under which the strike order was ostensibly recalled on November 11, agreed, in response to the suggestion of the President, to call a meeting of the general scale committee, the representatives of the district organizations and the international executive board of the United Mine Workers to be held at Indianapolis on Tuesday, December 9, at which time the President's proposal was to be considered and its acceptance by the miners urged by Mr. Lewis and Mr. Green. Tuesday was the day set for the hearing in the contempt proceedings before Judge Anderson, and it was understood these would be postponed or called off.

The nature of the President's proposal was not disclosed, but as it is understood the administration has approved the position taken by Fuel Administrator Garfield that no increases in wages should be allowed that will require an advance in coal prices it was thought that the proposed basis of settlement would approximate the 14 per cent advance proposed by Dr. Garfield.

The leaders of the miners' union had been put in a position, by the efforts of the Department of Justice, where the prospect that some of them would go to jail had become prominent as one of the alternatives to be considered. The department was said to be in possession of evidence that the notices recalling the original strike order, sent out on November 11 by order of the court, had not represented a compliance in good faith with the court's order, but had been sent out without the official seal of the union and in such a way as to leave doubt in the minds of those to whom it was addressed as to whether it was official. Evidence was also said to be available that some of the strike leaders had adopted surreptitious means of advising their followers to keep the strike alive pending the wage negotiations. Coal production had been gradually increased, and during the week ended November 29 was 5,429,000 tons, or about 45 per cent of the normal bituminous output.

Government Ownership No Alternative.—If money put into railroad securities is only to be thrown away, there will be no money put into railroad securities. And if the railroads cannot support themselves in a healthy condition, able to obtain fair rates for their maintenance, and new capital for their expansion, why, then, they cannot exist. There is no use of suggesting government ownership as an alternative. The American people have had of late about as much connection of the government with public utilities as they can stomach. As tested practically, it has been shown to mean little else than deficits soaring into the billions.—*Albany Knickerbocker Press.*

The Senate Discusses the Railroad Bill

Various Amendments Have Been Offered, but Comparatively Little Progress Has Been Made

LITTLE PROGRESS HAS BEEN MADE thus far in the consideration of the railroad bill in the Senate, which was begun on December 2. The first three days were taken up with an opening speech by Senator Cummins, chairman of the committee on interstate commerce, who explained in detail the provisions of the bill and the reasons which actuated the committee in adopting them and answered various questions put by the Senators. On December 5 the bill was read for amendments, and amendments were offered by Senators Curtis, Watson and Spencer, after which Senator Kellogg began a long speech which was occasionally interrupted by calls for a quorum Senator Kellogg favored the bill's principal provisions, including the anti-strike provision, and charged the Railroad Administration with enormous extravagances in the operation of the railroads and with building up a great central organization which, he said, "had benumbed the incentive and enterprise of every railroad organization." He also declared that inequalities in wage awards had added grossly to the cost of operation and lowered the morale of the service.

Senator Cummins said he thought it would tend to simplicity and clearness if the Senate should proceed with the consideration of the Senate bill, and after having made such changes in it as commended themselves to the judgment of the Senators should substitute it for the Esch bill as passed by the House, and in that way present a foundation for a conference between the two houses. That course, he said, was approved by the committee.

Senator Cummins said he did not intend to discuss at any length the merits of private operation, as compared with public operation, because the committee was so nearly unanimous that it was unnecessary for him to defend its position. He believed the great majority of the people of the United States, in view of the experience of the last two years, did not desire that public operation shall be continued, and it desired that the railroads shall be returned to their owners under such strict supervision and regulation as will insure justice at once to the owners of the properties and to the public as well. He expressed the opinion that the operation of a system of transportation is a proper governmental function, and it is only a question of how the people of the country can be best and most efficiently served. He would adopt public ownership and operation in a moment if he believed the people would thereby secure better, more adequate and cheaper transportation. In answer to the claim that government operation has not had a fair trial during the last two years, he said:

"Whatever may be the merits of government operation, I feel no hesitation in saying that the trial of the last two years in the United States has been the fairest trial to which that form of regulation could be submitted. The government has had every possible advantage in demonstrating efficiency in operation. First, the volume of the traffic of 1918 was substantially the same as the volume of the traffic in 1917, and in 1919 that volume had been not greatly diminished. The government has had the advantage of absolute authority. It has had no interfering or embarrassing conflicts with any department of the government. The director general, together with those officers who have been appointed to assist him in the administration, has been supreme; and I say again that it is not in my heart to criticise the action of the director general, save in one or two respects that may become material a little later on; but I now want to impress upon those who believe in government operation that the director general has been master of the whole situation. It was for him, and him only, to say what unification should take place. It was for him, and him only, to declare upon what routes traffic should be moved. There was no one to dispute his authority, no one to question his decisions, and if government operation could have a fairer opportunity to demonstrate its efficiency I can not imagine it. The director general had complete authority over rates. We dispossessed the Interstate Commerce Commission of all authority over the subject when we transferred these properties to the President of the United States."

Government Operation Expensive

Senator Norris asked whether if the government had not taken over the railroads they would have gotten through the war without trouble, and whether the country would have escaped the difficulties that have ensued.

"In my opinion," replied Senator Cummins, "they would have had very much less trouble than we have had so far as losses are concerned. Of course, if the people of the country desire to pay the price, government operation is entirely feasible. There is nothing that stands in its way if the people are willing to pay the cost." He added that he was not saying that either private operation or government operation could have gone on doing business at the same rates that prevailed before the war, but, he said, the government had a great deal better chance for successful operation under war conditions than the railroad companies had under peace conditions and that the main thing gained by public operation was the right to move traffic on any line that it was desired to move it on

"It is my judgment," he said. "that the railroads at the time the President took them over were doing better in the movement of traffic than they ever did afterward, but I do not say that the railroads could have continued to do business upon the rates which were then in effect any more than the government could continue under those rates."

Senator Norris said that those who favored government ownership would be opposed fundamentally to the kind of government control that we have had in the last two years. Senator Cummins said it was his judgment that the organization we have had for the last two years was better qualified, more competent to operate the railroads than the organization suggested by the Senator from Nebraska. He did not think it was an ideal organization, because it had too much arbitrary power. He believed that Mr. McAdoo and, following him. Mr. Hines, and especially Mr. Hines, had done the very best that could be done and had operated the properties just as cheaply as they could be operated, barring the increase in wages. No one, he said, can question the energy and the ability with which the railroad operations have been carried on. Senator Walsh suggested that the government's operation had been less successful than it might have been because it retained so many railroad men who retained all their prejudices and predilections against government ownership and that "while perhaps there was nothing in the nature of a conspiracy to depreciate in the public mind the policy of government ownership, yet there was no disposition evinced to make it a grand success."

Senator Cummins replied that if there has been a spirit

or motive of that kind, in his judgment it has been with those who have been excluded from the active management of the properties, and he firmly believed that the regional director, the superintendents and the railroad men, all the way down the list, have been faithful and loyal and have done all they could to secure an efficient and economcial management. However, he said, the government during the war has had the advantage of something which it can never again enjoy. It has had the advantage of the war loyalty.

Radical Change in Regulation Required

Turning to the changes in the methods of regulation proposed by the bill, Senator Cummins said it would be absurd for the government to restore these properties to the railroad corporations which formerly owned them unless the government believed at least that those corporations could resume the operation of the railroads and render to the people of the country the service which must be rendered if our commerce is to be sustained. One of these conditions is ability to borrow money. "No matter what we may think with regard to the wrongs which have been done in the past by the railroad companies, the railroads must be able to borrow money, because even if the government carries a billion dollars of their obligations for 10 years, as it must, in my judgment, or some such amount as that, the railroads must borrow another billion dollars, or some such large sum, in the coming year."

"Private operation of railroads cannot be continued as a permanent policy unless there is a radical change in our system of regulation. Our Interstate Commerce Commission has been a faithful, intelligent body of men. It has been, however, utterly impossible for the commission to establish a body of rates that would enable the railway systems to maintain themselves. It has been utterly impossible for any body of men to make a system of rates that will sustain the weaker railroads of the country without giving to the stronger railroads an income excessive and intolerable in its extent, and there lies the great fundamental obstacle in our system of rate-making. I look forward with very little optimism so far as private ownership and private operation are concerned. I am going to do my best to make private ownership and operation possible, but if these railway properties cannot be restored to their owners under such conditions and with such regulation as, in my judgment, will make private ownership and operation successful, then I am instantly and from that time forward for government ownership and operation."

In discussing the proposal that the commission shall be required to allow an average return of 5½ per cent, Senator Cummins said that 5½ per cent is more than he thought it ought to be. It seemed to him that a lower basis would furnish the credit which the railway companies must have, but the majority of the committee were of the opinion that 5½ per cent is a fair basis, and to that he finally agreed. He said he had previously stated that the compensation provided by the federal control law was something like $200,000,000 more than it ought to be. He was of the same opinion still, but he wished to point out that that was not inconsistent with his advocacy of a 5½ per cent basis, because in the federal control bill Congress was providing for an income for each individual railway, and he felt that the amounts which it was agreed to pay to a great many were excessive, but under the proposals of the bill there is no provision to pay to the stronger railroad companies the excessive income which is permitted under the federal control act.

Moreover, he said, the war has wrecked the world in a way. Conditions are abnormal and uncertain, and he looked with no optimism at best upon the return of the properties to their owners, because in view of a movement that is sweeping over the world with regard to property, its ownership, its use and its profit, he had the gravest doubt about whether those who have money will be willing to invest it in railway securities, no matter what rate of return is provided.

Regarding the provision for a division of excess earnings above 6 per cent, Senator Cummins said that, singularly enough, it is assailed from two quarters. The railway executives attack it bitterly on the ground that it is not only unjust but unconstitutional, and some very enthusiastic citizens who have no interest in railways attack it on the ground that it is an approach towards socialism or communism.

Dealing With Labor as a Commodity

Regarding the provision for a division of excess earnings Cummins said he was the father of a somewhat famous statement in the Clayton anti-trust law that the labor of a human being is neither a commodity nor an article of commerce, but, he said, "I am just as much opposed to Mr. Foster dealing with human labor as a commodity as I am opposed to Mr. Gary dealing with it as a commodity. It is just as fatal to the welfare of the United States to allow the American Federation of Labor to deal with labor as a commodity as it is to allow the National Association of Manufacturers to deal with it as a commodity."

He also said he believed in collective bargaining, and that nothing could be more wicked than the assertions which are being made that the bill would manacle the working man and reduce him to involuntary servitude. The bill, he said, does not pretend to interfere with or embarrass any man who desires to leave his employment. "He can quit, or 100 of them or 1,000 of them, can quit whenever they desire to do so, but I am not willing to allow the statement to go unchallenged that it is a fundamental and a constitutional right that every man can enjoy to quit his employment whenever he pleases. That is not true. A soldier cannot quit whenever he desires, an engineer upon a railway train cannot quit whenever he may desire to quit; a physician or surgeon cannot leave a dangerous operation half performed because it is his pleasure no longer to continue the work of his profession. It is our profound conviction that the civilization of America cannot continue, cannot endure unless organized society can find some plan to preserve industrial peace and order. This bill punishes only a combination or agreement between railway employees. Even if I were to grant that the individual right to cease employment is perfect and complete, I cannot grant that the right to enter into a combination or conspiracy to accomplish a purpose inimical to the welfare of society is a natural or constitutional right."

Compulsory Consolidation Objectionable

Provisions in the bill for compulsory consolidation were attacked as "objectionable" and "unworkable" by Senator Kellogg, who continued his speech on December 6. Senator Curtis, who followed him, opposed the proposed transportation board and urged that complete supervision of the railroads be placed in the hands of the Interstate Commerce Commission. He also opposed the consolidation provisions. Senator La Follette was expected to speak in opposition to the bill on Monday.

Director General Hines has conferred with Chairmen Cummins and Esch of the interstate commerce committees of the Senate and House, respectively, regarding the legislative situation, with a view to reporting to the President. He has also conferred with Senators Kellogg and Watson, who are members of the Senate committee.

A settlement of the coal strike would remove one of the factors of uncertainty in the plans for the return of the railroads.

German Railways Suffer from Lack of Equipment

Loss of Locomotives and Cars Delivered to Allies Severely Felt, Complaints Against Peace Treaty

By Robert E. Thayer
European Editor of the *Railway Age*

LONDON, August 12, 1919.

LITTLE INFORMATION has been made public relating to the actual condition of the German and Austrian railways, but what has penetrated beyond the frontiers of those countries has shown that the equipment of the railways is in poor condition, and that there is a large amount of rehabilitation to be done there in the matter of deferred maintenance and in the recuperation of the losses suffered from the war, both from destroyed and abandoned equipment and materials, and from equipment and materials that had to be given over to the Allies under the terms of the Armistice and the Peace Treaty

An Investigation

Considerable information of value, however, is given in a report of British army officers who made an investigation of transport conditions in Germany the early part of last April. In this report, which was made public only recently, conditions are analyzed in the several industrial districts of Germany.

Conditions in Silesia

It was shown that in Silesia there was a very great and real shortage of locomotives and rolling stock at that time. Furthermore, due to the use of substitute materials and lack of lubricating oils, those locomotives which were available were constantly breaking down. Table I gives some statistics of the Breslau railway.

TABLE I.—STATISTICS FROM THE BRESLAU RAILWAY

	Monthly average of locomotives	Average service of locomotives in kilometers
1913—		
October	1,277	3,640
November	1,286	3,444
December	1,295	3,527
1914—		
January	1,295	3,401
February	1,293	3,017
March	1,295	3,433
1918—		
October	1,233	2,789
November	1,248	2,517
December	1,226	2,436
1919—		
January	1,145	2,475
February	1,120	2,230

Percentage of total locomotives under repair

1918—		1919—	
October	34.1 per cent	January	36.9 per cent
November	33.7 per cent	February	40.1 per cent
December	34.2 per cent	March	40.3 per cent

Cars requisitioned and supplied for the transport of coal during February

	Upper Silesian coal area		Lower Silesian coal area	
	1919	1914	1919	1914
Asked	171,447	273,363	30,092	33,437
Supplied	97,502	273,363	16,104	33,437
Lacking	73,945	.....	13,988	.....
March—				
Asked	158,865	276,493	30,847	32,163
Supplied	134,323	276,493	24,608	32,163
Lacking	24,542	.....	6,239	.....

Requisition of trucks of all descriptions (with exception of coal trucks) in February and March, 1919

February, 1919—	Required	Supplied	Lacking
Covered wagons	46,953	46,566	387
Open wagons	41,017	26,819	14,198
Straw wagons	6,563	3,951	2,612
Trucks for logs, etc.	1,760	565	1,195
Rail trucks	1,295	662	633
Lime trucks	1,828	1,116	712
Workmen's trucks	7,190	5,970	1,220
March, 1919—			
Covered wagons	63,137	61,130	2,007
Open wagons	68,825	23,360	40,465
Straw wagons	8,888	5,603	3,285
Trucks for logs, etc.	3,943	672	3,271
Rail trucks	2,777	960	1,817
Lime trucks	1,825	1,654	171
Workmen's trucks	12,342	8,745	3,597

During peace time the number of box cars and open top cars in actual use were as follows:

In February, 1914....	60,492 covered cars	72,548 open cars
In March, 1914.....	75,964 covered cars	80,702 open cars

The situation in this part of the country was, at that time, extremely critical owing to the lack of transport. Factories were at a standstill, and unemployment was daily increasing.

Conditions in Bavaria

The Bavarian railway system (apart from the Palatinate) is divided into five areas, three of which were visited by the English military officers, as follows, Wurzburg, Nurnberg and Regensberg.

Tables II, III and IV were arranged from information and figures compiled by the presidents of the railway administration of these three areas. There is notably a lack of locomotives and cars, which was alleged to be due—

(a). To the obligation to deliver locomotives and cars to the Entente.

(b). Losses on the eastern front.

(c). Delayed repairs owing to the war.

(d). Shorter running life of locomotives and wagons owing to inferior materials (iron, for example, as a substitute for copper removed from the locomotives to be used in the manufacture of munitions, lack of lubricating oil, etc.).

(e). Lack of raw materials for executing repairs.

The situation has been partially improved by reducing passenger service as much as possible in favor of goods service. There were no repair shops at Wurzburg, but at Konig, the Bauer's Printing Press Factory was being used for repairing cars, and rails were being laid to enable that plant to repair a greater number of cars. There were at Nurnberg 42 locomotives and 59 wagons awaiting repairs. An average of 13 to 14 were being delivered monthly. The Maschinenfabrik Augsburg-Nurnberg has undertaken to repair all railway equipment at this point and 12 locomotives and some 70 cars were in the course of repair. It takes from 8 to 10 weeks to repair the locomotives and from one to three weeks to repair the cars. In the Regensberg area on April 5 there were 119 locomotives under repair, 230 passenger cars and 1,208 freight cars with average weekly deliveries of 10 heavy and 81 light locomotive re-

TABLE II.—NUMBER OF TRAINS IN WURZBURG, NURNBERG AND REGENSBERG AREAS ON AUGUST 1, 1914, OCTOBER 1, 1918, AND APRIL 1, 1919

	Main line passenger trains	Branch line passenger trains	Freight trains
Nurnberg—			
August 1, 1914	453	346	197
October 1, 1918	197	210	180
April 1, 1919	125	188	135
Regensberg—			
August 1, 1914	164	307	143
October 1, 1918	86	171	94
April 1, 1919	60	147	77

	Express trains	Slow trains	Local trains		
Wurzburg—					
August 1, 1914	77	79	24	..	159
October 1, 1918	18	42	22	..	195
April 1, 1919	8	30	18	..	136

Note.—It is alleged that, owing to the condition of the locomotives, freight cars can only carry 80 per cent of their pre-war capacity.

TABLE III.—NUMBER OF LOCOMOTIVES IN WURZBURG, NURNBERG AND REGENSBERG AREAS ON AUGUST 1, 1914, OCTOBER 1, 1918, AND APRIL 1, 1919

	Passenger train locomotives					
	Light			Heavy		
	Total	In repair	In use	Total	In repair	In use
Wurzburg—						
August 1, 1914...	70	12	58	35	6	29
April 1, 1919.....	56	20	36	29	15	14
Nurnberg—						
August 1, 1914....	70	12	58	35	6	29
October 1, 1918...	212	64	148	46	17	29
April 1, 1919.....	210	63	147	32	10	22
Regensberg—						
August 1, 1914....	192*	28	164	44	5	39
October 1, 1918...	190*	55	135	38	12	26
April 1, 1919.....	188†	56	132	38	17	21

* Including 144 branch line locomotives.
† Including 112 branch line locomotives.

	Freight locomotives					
	Light			Heavy		
	Total	In repair	In use	Total	In repair	In use
Wurzburg—						
August 1, 1914...	48	9	39	96	17	79
April 1, 1919.....	56	27	29	112	68	44
Nurnberg—						
August 1, 1914....	210	50	160	10	2	8
October 1, 1918...	179	65	114	32	12	20
April 1, 1919.....	178	61	117	36	18	18
Regensberg—						
August 1, 1914....	152	23	129	7	2	5
October 1, 1918...	144	32	112	15	5	10
April 1, 1919.....	121	41	80	12	5	7

TABLE IV.—DEMAND FOR FREIGHT LOCOMOTIVES AND NUMBER ACTUALLY SUPPLIED IN NURNBERG AND REGENSBERG AREAS ON OCTOBER 1, 1918, AND APRIL 1, 1919

	Covered wagons	Open wagons	Special wagons
Nurnberg—			
October 1, 1918—			
Demand	1,363	678	162
Actually supplied	707	469	67
April 1, 1919—			
Demand	723	1,193	184
Actually supplied	627	455	62
Regensberg—			
October 1, 1918—			
Demand	1,008	496	161
Actually supplied	549	425	193
April 1, 1919—			
Demand	622	952	353
Actually supplied	529	369	57

pairs, 22 heavy and 68 light passenger car repairs, and 129 heavy and 670 light freight car repairs.

At that time there was a lack of raw material, both for the purpose of repair and to keep the rolling stock in use in good repair. Lubricating oil, copper and rubber were most urgently needed. Iron, varnish, tin, axles, leather and cotton waste (as a substitute for which thin wood shavings were used) are also needed.

Conditions in Munich

Owing to the disturbed condition in Munich during the time the British representatives were there, but little information was obtainable. However, it was reported that on all except the most important lines fast trains had been entirely discontinued. On April 13 two trains per day were running to Berlin (by different routes), and one fast train ran three times a week on the Landshut, Salsburg and Lindau lines. The last three services were run with one locomotive only. The slow trains had been reduced to one-sixth their former number, while the number of freight trains had fallen by about ten per cent. In the case of the latter, however, the average load had been reduced by some 30 per cent owing to the fact that the heaviest locomotives had been handed over to the Entente, and those which remained were not capable of doing the same amount of work. The number of locomotives available in August, 1914, and April, 1919, are as follows:

	August, 1914	April, 1919
Augsburg area	91	51
Munich area	209	147
Ratisbon area	148	92

During the week ending March 29, 1919, there were required 22,260 box cars and 36,591 open top cars. Of these 2,200, or about nine per cent of the box cars, and 29,699, or 81 per cent of the open top cars, could not be put into service. Furthermore, there were practically only 10 to 12½ tons capacity cars available, as the 15 and 20-ton capacity cars had been handed over to the Entente under the terms of the Armistice.

At that time about 40 per cent of the locomotives were under repair, whereas before the war the average was 18 per cent. The output of the shops has diminished by over 30 per cent, in spite of an increase in the number of employees from 8,000 to 13,000 men. This was due chiefly to the fact that the equipment was in very bad shape, and also to the reduction of the efficiency of the workmen owing to insufficient food.

The efficiency of the railroads as a whole is about 40 per cent less than before the war, owing to the increased necessity for repairs, and the delivering of the best heavy locomotives to the Entente. Over 10,000 freight cars were waiting repair at the time this report was written, and the work cannot be carried forward very fast owing to the lack of tools and material.

Articles published in German papers and abstracted in the Reconstruction Supplement to the Review of the Foreign Press, a fortnightly publication issued by the War Office of Great Britain, bring to light further interesting information.

German Complaints on the Peace Treaty

German papers have complained bitterly of the effect the Peace Treaty has on the German-Austria railway system. The Neue Freie Presse in commenting on the new boundaries states:

The frontier now cuts off from German-Austria the railway line from Hungary to Switzerland, passing through Pragerhof, Marburg, Unterdrauburg, Klagenfurt, Villach, Frauzenfeste, Bozen, Meran and Mals, and forms a connecting link with the eastern part of Switzerland, on the one hand, and Landeck, in the Tyrolese Upper Inn Valley, on the other (the Arlberg line). Only the short section leading from Vienna into the Klagenfurt Basin is to be left to German-Austria. This line is not only regarded as a through line, but is intended to link up the railway lines of German-Austria with the south. If the new frontier is legalized all the lines running from north to south would be cut through at, for the most part, unimportant places, and would be left without any connection, one with another, in German-Austria. It would be impossible to extend the Aspang line to Pettau, as the Slavs would naturally prefer to build a line to the Hungarian plains. The Spielfeld-Luttenberg and Vienna-Trieste lines would be open to foreign countries at Spielfeld, the Zeltweg-Unterdrauburg line at Lavamund, the Luttenberg-Launsdorf line at Brückl, the Vienna-Klagenfurt line at a point south of St. Veit, and the Brenner line at the Brenner, but a connection inside German-Austria would only be possible by a roundabout route, and there is no money for the building of new branch railways. Only the Vienna-Semmering-St. Michael-Villach-Arnoldstein line, affording direct connection with the sea at Venice, would be left to German-Austria, and Central Styria, being far removed from the line, would lose all importance. In the north the railway junction at Gmünd and the March, and with the latter the possibility of a Danube-Oder Canal and a sufficient coal supply would be lost to German-Austria.

Undue Preference to Poland Alleged

Dr. Walther Plenk writes to the Oesterreichische Volkswirt (June 28) complaining bitterly of the undue preference shown to Poland in the Peace Treaty. In no direction is this more apparent than in the matter of the railways, for not only is German-Austria compelled to surrender to Poland all the railway construction works and plant in a perfect condition and all the rolling stock appertaining thereto in a condition of normal repair, but in addition an Experts Committee appointed by the Allied and Associated Powers is to determine how many locomotives, passenger coaches, and trucks are to be surrendered.

Poland, a country which now demands rolling stock from German-Austria, was unable, Dr. Plenk says, to provide one single locomotive passenger coach, or goods wagon in order to maintain the railway traffic indispensable for the economic life of the country, but year by year many millions of Austrian money were invested in Russian Poland for railway purposes, the investors relying on the loyalty of Polish people. When at the end of 1918 the Austro-Hungarian Empire collapsed, nearly all the Austrian rolling stock remained in Russian Poland, but this in Dr. Plenk's view, should not be regarded as Polish war booty, but as property loaned to a neighbor friendly up to that time. It is therefore extremely unfair to demand further rolling stock from German-Austria in addition to the locomotives and wagons thus illegally detained.

The Austro-Hungarian army authorities bent on strengthening Russian Poland economically and in opening up to traffic districts hitherto neglected by Russia were not frightened by the vast expense of constructing light railways 400 km. in length. Huge masses of railway and light railway material belonging to the army authorities were left behind in Poland, and German-Austria, as one of the States succeeding to the heritage of the old Empire, has a right to a share of this material. But the Peace Treaty ignores this fact, complains Dr. Plenk, and only pays attention to the advantages of the Allies.

Equipment Builders

On account of the coal shortage in Germany and the labor trouble the output of the manufacturers has been reduced to the extent that the Danish and Norwegian State railways, customers of long standing of the Hanover Engineering Company, have gone to America for large locomotive orders. On the other hand, the war manufacturing plants are turning their energies to equipment building.

The Frankfurter Zeitung (July 11) states that the directors of the Krupp Works in Essen-Ruhr intend to reengage in the manufacture of railway material in future.

Before the war Krupps had a considerable output of railway material, and an arrangement has been made with the Prussian state Railways Administration that contracts will be assured to the firm; but this could only be achieved by granting the Government comprehensive insight into the conduct of the business of the construction of locomotives and carriages. The late gun-carriage works have been recently fitted out for the production of railway material, so that this section can now employ 2,000 workmen. The State Railways Administration has promised to order 100 locomotives and 2,000 carriages every year. In accordance with the agreement, only a certain percentage of profit is to be allowed to Krupps, the State Treasury is to benefit from any surplus. Any loss which may arise is to be borne by the firm. The State is to examine every item in the cost of production. The firm is endeavoring to secure other peace work for the former artillery workshops, but this is very difficult. A staff of 34,000 would be required to keep the works fully employed. Lack of coal and raw material in general keeps the present output at a low level.

Expediting the Release of Cars in Company Service

Measures to Be Taken by the Maintenance Department to Avoid Unnecessary Use of Equipment.

THE NECESSITY for practicing economy in the use of cars employed in company work is fully as urgent as with those employed in revenue service, but all railway employees and officers have not realized this fact to the fullest extent. This matter is of greater importance to those engaged in some branch of maintenance of way work since this department uses the largest number of cars, and with the idea of indicating what can be done, four officers of this department discuss measures which may be taken to reduce the use of cars to a minimum.

Understanding of Traffic Methods Essential

By John Evans
Division Engineer, Michigan Central, Detroit, Mich.

As shippers, maintenance employees can aid in car conservation by the intelligent selection of loading points when there is more than one place from which shipment can be made; by loading cars as soon as placed; by loading to capacity; by promptness and care in carding and billing and by sending consignee immediate and complete notice of shipment.

Where material to be shipped is available at more than one point, consideration should be given to the amount of switching necessary and the probable amount of time required in getting the empty car to the point of loading and in getting the loaded car from point of loading to destination.

In carding and billing, care should be used to make shipping instructions correct, clear and complete. This is particularly important on shipments into large terminals. On these shipments the particular yard and track to which cars are destined should be shown. If shipments involve a large number of cars, the operating department should be consulted on making out the billing so that any additional information which might facilitate movement or tend to avoid confusion may be shown.

The shipper should lose no time in sending notice to consignee. If the shipment arrives in advance of this notice, it is frequently necessary to defer unloading while the consignee is trying to find out where the material is from and what work it is to be used on. On account of the possibility that car cards may have been made out incorrectly and also on account of the liability of cards becoming lost or misplaced, it is not advisable to take them as authority for unloading cars in the absence of notice from the shipper. All parties handling shipping information between loader and consignee should give the forwarding of this data preferred attention.

A foreman should be given to understand that he is responsible for getting the car placed and should advise his superior in case his request for placing is not complied with within a reasonable time. The interests of the maintenance and operating departments in the prompt release of cars are mutual and the matter will be taken care of, if called to the attention of the proper authorities. Therefore, in case of serious delay in unloading the cars, the excuse that the car was not placed should not be accepted.

The car shortage has been met by commercial shippers to some extent by the use of motor trucks in both long and short hauls. There are localities where the use of teams or trucks in handling maintenance of way material offers a promising field. This is particularly the case around terminals where the amount of material to be moved is large and where the hauls on cars, though short in distance, require a great deal of time on account of the slowness of yard movements.

Shipping Bureau Suggested

By M. A. Box, Roadmaster, and F. C. McKnight, Roadmaster's Clerk, Kansas City Southern, Neosho, Mo.

Centralization of responsibility, with a directing head, is essential to any scheme which will effect the efficient handling of company material with the fewest possible number of cars. For this reason, in so far as it is possible to do so without encroachment on the powers of any department, it would be wise to create a subdivision in an appropriate department vested with authority to plan and direct the assembling, transportation and distribution of company material, or with authority to determine and exact certain requirements of any department wishing the use of cars for such work. Such a subdivision might be established in and conducted through the roadmaster's office with the following particular advantages: (1) This office is in direct control of permanent labor forces at all points of the road, by reason of which it could arrange more effectively for the use of these forces in co-operation with other departments for the prompt release of rolling equipment without interference with the regular duties of such forces; and (2) the great bulk of company material is handled under the immediate direction of this office, by reason of which this office would have the problem well in hand at the outset and might, therefore, the more readily determine its solution.

The following is a summary of measures suggested as affording considerable benefit in effecting an economical use of cars:—(1) Utilizing local freight service in assembling and distributing small shipments of track and switch material. (2) Distributing small shipments of rail on one car, each section crew to unload its own allotment. (3) Instituting shipping days when track gangs can arrange to be near stations to assist in loading or unloading. (4) Emphasizing the necessity of foresight in ordering before the need becomes emergent. (5) Impressing the doctrine of "capacity loads" on work train foremen. (6) Avoiding shipments of material away from a point where it will soon be needed. (7) Providing emergency facilities for coaling engines to avoid holding coal cars. (8) Co-operation between departments in making shipments. (9) Using placards, posters and circulars to urge employees to exercise vigilance in releasing cars.

Handling Bridge and Building Materials

F. L. Burrell, supervisor of bridges and buildings, Chicago & North Western, Fremont, Neb., submits a method of procedure which he follows in handling bridge and building material.

Our plan is to load the cars and send them to the station nearest to the unloading point, have the local train following pick them up and the bridge men unload the materials and rebill the car to the division material yard. Instructions have been given the yard material foreman to see that all cars are loaded to their full capacity.

In order to get the capacity load we take one or more bridges, as the case may be, requiring renewals, and have the material loaded in such manner as to allow unloading at each bridge, without having to tumble the load about to get at any of the material.

In the matter of repairs, the gang or line foreman is given a schedule of the work to be done and he will either send in a statement of the territory he is to cover and have us make up the loading or he can make up a list of the material that will be a full load.

To insure promptness in the handling of cars we have a list of the cars received each morning and of those unloaded and if any delay is shown we ascertain the reason. If the reason is unsatisfactory we go after the man responsible and straighten him out.

The Supply Train

The supply train has a number of advocates. S. C. Tanner, master carpenter, Baltimore & Ohio, Baltimore, Md., gives the following rules under which his system has proven successful:

(1) In all carload shipments the car should be loaded to full capacity, billed out promptly and the exact destination given so that the transportation department can deliver the car with the least possible delay, and the agent at destination should advise by wire as soon as the car arrives. (2) Cars should be unloaded and released as soon as they arrive. This should be arranged for by the officer in charge before shipment is made. (3) When large shipments of rails or ties are made, a work train should be ordered to unload and distribute the material as soon as it arrives. (4) Single carload shipments, and less-than-carload shipments should be handled by the monthly supply train, and should not be loaded until a day or so before the supply train starts out.

On a heavy territory like the Baltimore division of the Baltimore & Ohio the supply train will cover an average of 60 miles per day. The force consists of 10 to 15 local track men in charge of a track supervisor and an assistant storekeeper. The rail unloader is always part of the equipment of this train. Bridge and building materials are also shipped on the supply train, and so marked that the proper amount will be unloaded at stations, or between stations, as the case may be, and at the exact location needed. Surplus materials are also collected by the supply train and moved to other places where they are most needed.

Freight Traffic Movement and Car Performance

In October for the first time this year since January, the number of net ton miles of revenue and non-revenue freight handled by the railroads exceeded that for the corresponding month of last year, according to the monthly report of the Operating Statistics Section. The net ton miles in October this year amounted to 40,343,750,000, an increase of 1.3 per cent. For 10 months of the year the net ton mileage was 328,792,002,000, a decrease of 10.6 per cent as compared with the corresponding period of 1918. For the 10 months' period decreases are shown in all regions. For October there were decreases in the Central district, the Ohio-Indiana district and the Eastern region as a whole, and in the Northwestern region.

In the New England district there was an increase of 20 per cent. The net ton miles per mile of road per day in October averaged 5,651 as compared with 5,584. The train mileage showed an increase of 1 per cent and the car mileage of 6.6 per cent. The net ton miles per train mile increased from 720 to 722, but the net ton miles per loaded car mile decreased from 29.7 to 28. The car miles per car day increased from 26 to 27.3 and the net ton miles per car day averaged 524 as compared with 525. The percentage of loaded to total car miles was 68.4, as compared with 67.9. The average number of freight cars on line daily show an increase of 1½ per cent, while the percentage of unserviceable cars was 7.4 as compared with 5.9.

For the 10 months' period the net ton miles per mile of road per day averaged 4,687 as compared with 5,234. The train miles show a decrease of 12.6 per cent and the car miles a decrease of 7 per cent. The net ton miles per car day averaged 442 as compared with 492 in 1918. The net ton miles per train mile were 697 as compared with 682 and the net ton miles per loaded car mile were 27.9 as compared with 29.2.

Development of Present Railway Situation in Canada*

The Events and Policies Which Have Tended to Create a Dominion Owned Transcontinental Line

THE PECULIAR SITUATION which now exists in Canada, viz., that of a government-owned transcontinental line in direct competition with a privately owned transcontinental line, each with its network of branch lines throughout the traffic-producing districts and practically paralleling each other across the continent, cannot be thoroughly understood without a knowledge of the events which led up to this situation. No explanation of the extensive adoption of railway nationalization in Canada has been made other than that it seemed inevitable because of the financial difficulties into which certain roads fell. It has been taken for granted by government officials that the people of Canada would regard this action as inevitable, and most of the people have done so, and in consequence the tendency toward nationalization has not been made a clear-cut issue, while neither has nationalization been openly announced as part of the government policy, nor has there been a serious discussion of its effects upon the public welfare. In Canada's railway history are to be found the causes of the present peculiar situation. In the policies pursued by earlier political administrations, and the action taken as a result of these policies, one will find the real causes of the present situation, fraught as it is with possibilities of disaster, but which is, as yet, too new to admit of the forming of definite conclusions.

Early Railway History

Canada's railways were born of the necessity for uniting the provinces of eastern British North America as well as to secure for Canada the opportunity of carrying its share of the products of the West to the world's markets. In this early development were included the inception and construction of the Grand Trunk and of the Intercolonial, in both of which the Maritime provinces in the east and the Imperial government were interested.

In 1846 the repeal of the Corn Laws by England, enabling American grain to enter Great Britain on the same terms as Canadian grain, brought the Grand Trunk project to a head and made doubly necessary the construction of lines to lower the cost of transportation from the producing areas in the west to England. The St. Lawrence river and the Gulf of St. Lawrence were very difficult of navigation, and consequently involved higher charges than were in effect from New York. The construction of the Grand Trunk was also hastened by the extension of railways into the grain-producing districts of the United States, and the resultant fear on the part of the Canadians that Canada's grain would eventually find its way southward to these direct and convenient lines in the United States, thereby injuring the heavy capital investments already made in the western provinces. Thus the Grand Trunk was conceived as a main trunk line to connect with Canada's inland navigation system and to compete with the railways of the United States.

Up to this time the Intercolonial and Grand Trunk projects could not be viewed as separate. The scheme as formulated provided for a main trunk line having an outlet at Halifax, with an extension into the Maritime provinces. Two surveys had been made for a road of this kind, one by the British government from Halifax to Quebec along the coast of New Brunswick, because of the military considerations involved; the other, an earlier proposed route, in a more direct line to Quebec along the American boundary. The people of New Brunswick were not desirous of contributing to the construction of a line of railway which would pass through a sparsely settled portion of their province and terminate at a Nova Scotian seaport.

As the discussion of the building of Canada's first railways continued it became apparent that because of the inability of the Imperial government and the provincial government to agree the two projects would eventually be separated. The expected break finally came and the main trunk line scheme, which afterwards became the Grand Trunk, was officially started by the passage in the Canadian Parliament of three measures in 1852 providing for a Dominion guarantee of £3,000 to the mile, the amalgamation of a number of existing charters and the incorporation of the Grand Trunk. A prominent English contractor made arrangements with the Hon. Francis Hincks, then Inspector General for Canada, both to construct a line and to promote the company.

The years immediately following the start of the Grand Trunk, from 1852 to 1857, were years in which the building of railroads comprised the chief financial activity in Canada. Towns and villages, under a municipal loan act, pledged their credit for railroad enterprises recklessly, and in the end created a serious financial situation. The Grand Trunk project was soon in difficulties and the provincial government was forced to come to its aid repeatedly.

As the line neared completion this unfortunate condition failed to improve, because the traffic the railway had expected to carry did not materialize. The road was originally projected to co-operate with the St. Lawrence river, but it was located entirely independent of this idea, due principally to the efforts of its English directors. The route selected made the Grank Trunk a through line and consequently a competitor of American railroads and also of the Canadian canals. In addition, the Grand Trunk came in competition with the Great Western, built beween 1853 and 1856 from the head of Lake Erie to Niagara to compete with the Welland canal. As a result of this change in policy and location not enough traffic was offered to the road to make it a paying proposition, and the company was in financial difficulty practically from 1855 to 1862, when it defaulted in interest payments on its bonds and threatened to close the road. The result was that the government was forced to supplement its previous loan by permitting the issue of second preference bonds and by withdrawing the interest claims on its loan until dividends were earned on the common stock.

In 1862 the company was reorganized and its bond issues converted into preferred stock. From this point the history of the Grand Trunk concerns itself with the following of a safer policy, a policy freer from political interference and national consideration. Connections were obtained enabling it to bid for long-haul service, branch lines were developed to further the local service and several connections were acquired, among them the Great Western and the St. Lawrence & Atlantic, the latter a Portland, Me., connection.

Meanwhile the Intercolonial portion of the original railway scheme had been developing. After the subdivision of the original plan into the two projects already mentioned, the eastern colonies began constructing roads which they believed best served their respective interests. In the end

*This is the second of a series of articles on railway nationalization in Canada. The first appeared in the *Railway Age* of November 7, page 907. The concluding article, treating the development of the present situation, will appear in the next issue.

these separate provincial enterprises were consolidated because of the strained relations existing between Great Britain and the United States and the desire to bring about confederation of the Canadian provinces. The Intercolonial was made part of the compact to bring the Maritime provinces into the confederation and, in being located uneconomically as it was, it served the purpose of uniting the colonies and providing a military road far from the American frontier. It was realized that a road so located could never be successful from the standpoint of traffic, but this consideration was thrown aside because of the demand of the government for a line accessible to the sea and at the same time remote from the American boundary. The whole line was opened for traffic in 1876 and, true to form, has never been a financial success to this day.

Thus Canada's railway system was born of a mixed and complicated policy of government and provincial assistance, ownership and operation, and private ownership and operation. Indirectly the present situation in Canada can be traced back to these early policies. The completion of these two roads marks the close of the first period of Canada's railway history. The colonies in the confederation were united, the provinces of Quebec and Ontario were made accessible to Canadian ports during all seasons, and Canada was enabled to compete effectively with American roads for the grain traffic to Europe. Following the construction of these two main lines the customary development and construction of branch lines continued, giving Canada after a time a fairly well-defined railway system.

The Era of Transcontinentals

The next step in Canada's railway history concerns itself chiefly with the extensions westward. Not only does it concern itself with these extensions but also the carrying westward of the same considerations that had been instrumental in building both the Intercolonial and the Grand Trunk in the east.

There enters into the first transcontinental railway project the necessity for the uniting of Canada's provinces —in this case British Columbia to the other provinces— the race westward between railway construction in Canada and in the United States and the fear prevalent at that time that the United States might, through the development of its railways, win the traffic of the grain provinces of western Canada and the military necessity for the establishment of communications with these new western territories.

It might be well to note here that with the apparent complexity of the policy pursued by the government in regard to railway construction, and the controversies it has caused, there had been up to this time a remarkable consistency in this policy. The construction of the Canadian Pacific Railway, or the Pacific railway as it was called at that time, came as a step subsequent to the entrance of British Columbia into the Canadian federation. A provision in the British Columbia entrance agreement stipulated that a transcontinental line should be built for, first, national unity and, second, commercial advantage. It is on these two fundamentals that the Canadian government's railway policy has thus far been constantly built.

From 1872 to 1880 the Pacific railway project was to a large extent a matter of controversy between political parties and competing contractors. The Liberal party, then in opposition, urged the gradual construction of the transcontinental line as traffic developed, whereas the Conservatives advocated pushing the project through to the coast as rapidly as possible. The project remained in a nebulous state until 1880, when the Conservatives, on their return to power, submitted a contract to Parliament providing for the construction by the Canadian Pacific Railway Company of a road from Lake Nipissing to the Pacific coast, the portion already constructed to be taken over as part of the system. This contract was accepted.

Sir John MacDonald, then head of the Canadian government, stated that it was the government's intention to be liberal with the company, and the agreement as prepared provided for a money subsidy of $25,000,000 and a land subsidy of 25,000,000 acres. These grants, however, did not complete the assistance granted the Canadian Pacific. The company was allowed entire freedom in locating its lines, a provision was included in the agreement to the effect that for 20 years no line of railway should be permitted to be constructed south of the new line, and the road was granted such privileges as freedom from taxation and the remission of customs duties on construction materials. On the other hand, there was included in the agreement a clause which provided that if the profits should exceed 10 per cent of the capital invested the rates then in effect might be reduced. Thus the Canadian Pacific began as a private company, but with liberal assistance from the government.

The main line was completed in 1885, the whole distance of 2,906 miles being covered approximately five years before the termination of the contract time. Meanwhile, the promoters of the Canadian Pacific had been busy forming connections for the road, acquiring other branch line properties and in general building up a network of traffic-producing lines throughout the territory which it was designed to serve. This development work on the part of the road's directors created a system of 4,338 miles by the time the main line was completed in 1885.

However liberal the terms may have been, they were not sufficient to prevent the Canadian Pacific from applying to the Dominion treasury for financial assistance. The amount of this assistance at the time of the Drayton-Acworth report in 1917 was placed at $66,905,481, which is exclusive of the value of the land grants and also of the road built and surveys made by the government previous to this agreement and turned over to the company free of cost. The cost of this government work, according to the Drayton-Acworth report, was $37,785,320, and the proceeds of land sold to June 30, 1916, $123,810,124, making a total public assistance to the Canadian Pacific of $228,500,925. The period immediately following the completion of the line in 1885 was one of rapid development in mileage, due both to the construction of branches and the acquisition of lines already constructed.

This brief résumé of Canada's railway history brings it up to approximately 1903. Aside from the deficits which the government was called upon from time to time to make good, it was up to this time free from any serious trouble from the railways. Beginning with that year there is a more direct connection between the policies followed and the present situation.

As the Canadian Pacific developed and expanded rapidly it began to encroach upon territory in Ontario formerly served exclusively by the Grand Trunk. The latter naturally viewed this development jealously, and when the rapid development of the provinces of Manitoba, Saskatchewan and Alberta began to tax the transportation facilities and equipment of the Canadian Pacific a second transcontinental line was conceived. This project, backed by Sir Wilfrid Laurier and his party, was presented to the people of Canada, who immediately endorsed the project on the basis of the necessity for the development of the northwest. Back of this support there seemed to be a certain amount of hostility toward the Canadian Pacific, especially in the western provinces, on the grounds that it was monopolistic and that it was charging unduly high freight rates. In defense of the Canadian Pacific it should be said that this hostility was due to the monopolistic position of the road rather than to its actions.

The agreement for the construction of the new road was drawn up between the Grand Trunk railway and the Dominion government, providing that the road was to consist of two sections, from Moncton, N. B., to Winnipeg, Man., a distance of 1,800 miles, and from Winnipeg to the Pacific coast, a distance of 1,756 miles. The eastern division, called the National Transcontinental, was to be constructed by the government and, after its completion, leased to the Grand Trunk Pacific for operation. The western division, the Grand Trunk Pacific, was to be built by that company under a bond guarantee of three-quarters of the cost of construction, such cost not exceeding $13,000 per mile. Furthermore, the government agreed to make up under an implement clause the difference between the amount realized on certain bonds and their par value. In the case of the mountain division the government agreed to pay the interest on the bonds for seven years. It was under such an agreement, which can readily be seen to have made it practically a government undertaking, that the second transcontinental line was conceived.

At this stage the project seemed feasible and, because of the exceptionally rapid development of the western grain provinces, it gave every promise of being a success. When, however, the actual work of construction on the two sections of the road began it was found that the estimates were far below the actual cost. The expenditures on the National Transcontinental so far exceeded the estimates that, upon its completion, the Grand Trunk Pacific refused to undertake its operation, it being provided in the agreement that the rental of the road should be based upon its cost of construction. The refusal of the Grand Trunk Pacific to take over the National Transcontinental made it necessary for the government itself to place it in operation.

During this period there was an enormous amount of railway construction under way in western Canada and a consequent rapid development of this territory, all of which produced a great increase in the price of all railway materials and in the cost of labor. The Grand Trunk Pacific found that the task of financing its own line had proved to be too heavy. The result was that the government had not only to operate the National Transcontinental but to assist the Grand Trunk Pacific to complete its lines. This aid at the time of the Drayton-Acworth report totaled $70,311,716, which includes subsidies and other cash aid and which, coupled with the Dominion government investment in securities and guarantees made by the Dominion, totaled $114,470,884. More recently in the 1918 session of Parliament the Grand Trunk Pacific was granted $7,500,000, which was expected to enable the line to operate until July, 1919. However, owing to a bad harvest and heavy increases in operating expenses, this subsidy was rapidly exhausted and it was necessary to take the action indicated in the first of this series of articles.

It is almost impossible to speak intelligently of the situation of the Grand Trunk Pacific during these past few years without taking into consideration its relation to the Canadian Northern project. The Laurier government, soon after entering into the agreement with the Grand Trunk Pacific for the construction of the second transcontinental line, backed the promoters of the Canadian Northern for the construction of lines which constituted practically a third transcontinental, and which parallels approximately 2,000 miles of the Grand Trunk Pacific.

The Canadian Northern came into being with the purchase in 1896 of the charter of the Lake Manitoba Railway & Canal Company by Sir William MacKenzie and Sir Donald Mann. The following two years chronicled rapid additions of new and old charters and the construction of a network of lines in the prairie provinces, until finally the MacKenzie-Mann roads reached the head of the lakes at Port Arthur. The system at this time might be termed successful. MacKenzie and Mann had secured large dominion and provincial subsidies, and all of the new lines were constructed cheaply with heavy grades and little grading, timber bridges, etc., the idea being first to open large areas with as small expenditures as possible and then, as the traffic developed, gradually to improve the lines to a normal basis. In so opening up the country the roads developed a heavy tonnage of grain, and this traffic largely made their early success.

Had the system remained in this position it probably would have been successful today, but MacKenzie and Mann felt that their system could not be the success they wished it to be unless it extended to the eastern ports. Port Arthur is closed for approximately four months of the year, and the extension eastward was conceived to give the Canadian Northern all the year traffic. While the Grand Trunk was maturing its plans to build into the grain areas of the west, the Canadian Northern was authorized to build eastward toward Ottawa and Montreal and at the same time westward to the Pacific coast. At the same time the Grand Trunk idea of extending into the grain areas of the west was maturing, and it would naturally be supposed that in some way the two plans would have become co-ordinated, but this did not take place.

The Candian Northern built its line to Toronto, Ottawa, Montreal and Quebec through a wilderness. This extra mileage, built at a heavy expense, brought practically no additional traffic in eastern Canada, where the older roads were strongly entrenched. The heavy load of this added expenditure overcame the earnings of the western lines and soon put the Canadian Northern in financial difficulties. In 1914 the road notified the Dominion government that it would be unable to meet its fixed charges, and since then, up to the time of the Drayton-Acworth report, approximately $60,000,000 had been given the Canadian Northern in order to maintain operation. As a result of this lack of co-ordination and lack of foresight in the railway policies adopted by the Dominion government at that time, both the Canadian Northern and the Grand Trunk Pacific have been in financial difficulties ever since.

Results of Canadian Railway Development

The preceding is a brief resumé of the beginning and development of Canada's transportation system. The government from the beginning has extended encouragement and aid to practically every transportation project which has been brought to its notice, and has not only aided the original project but has granted liberal assistance for the maintenance of service on the lines after their completion. The results of this policy are now coming to light. In fact, the climax came with the appointment of a Royal Commission of Inquiry in July, 1916, for the purposes of presenting a solution of the grave financial problems presented by the position of the Grand Trunk Pacific, the Canadian Northern and the Canadian government railways.

The policy of the government always has been based on national considerations. Whether it was for the purpose of obtaining eastbound traffic, for military purposes in case of an American invasion, for development of the western territory or for the retention of western Canada traffic for Canadian trade channels, the fundamental purpose has been the same. In addition, there have been economic considerations, although these, unfortunately, have not been given much weight. Had the construction of the railways been based on economic grounds many of them would not be developed to the stage to which they are now.

Whatever may be said in justification of this national policy, one fact remains indisputable, namely, that roads so conceived and constructed could not reasonably be expected

to be for a long time, nor have they been, successful from an economic standpoint. Those who were responsible for the construction of many of Canada's roads apparently were unable to see this. Perhaps in their enthusiasm for the development of Canada they believed that this development would compensate for any deficits which might be incurred in the early operation of the roads. In the long run this view may prove to have been right. It is certainly true that portions of Canada are still undeveloped, and in the future these railroads which have been in financial difficulties may be able to vindicate their existence. This, however, does not alter the present situation. One development which cannot be defended is the wholesale duplication of lines in territories in which the traffic was unable to support more than one line. Especially has this been true in the case of the Canadian Northern and the Grand Trunk Pacific. Traffic sufficient to maintain these parallel lines simply could not be produced. The undercurrent of animosity in western Canada toward the Canadian Pacific must also be considered a cause contributing to the present situation. This animosity partially led to the acceptance by the public of the construction of much of the western mileage, and especially the Grand Trunk Pacific and the Canadian Northern.

There are two causes which might be said to be the final and direct causes of the present situation. The first of these is the war. When Canada entered the war in 1914 as part of the British Empire the cost of railway materials and labor shot upward far faster than railway rates and revenues. It was in this period that large parts of both the Canadian Northern and the Grand Trunk Pacific were opened for traffic, and the abnormal conditions, not only as to operating expenses and revenue but as to traffic, made their difficulties doubly great. The financial difficulties of many of the Canadian roads were augmented by these abnormal conditions, and even the Canadian Pacific, with its great financial strength, showed the effect of them.

The other direct contributing cause referred to is propaganda carried on in Ontario by the Hydro Electric Commission. This commission operates a government-owned public service utility and has been providing electrical power to municipalities at a low rate. The power is produced at Niagara Falls and is far in excess of the present requirements. The Hydro Electric has reached the limit of its usefulness unless the excess power created can be employed for some purpose other than municipal service. The next step in its development is considered to be the electrification of the branch lines of the Grand Trunk in Ontario. Under private ownership of the Grand Trunk this is difficult to bring about, but if the Grand Trunk were to become the property of the government it is argued that it would be but a natural step to turn the branch lines of this portion of the government system over to the Hydro Electric, and other government enterprise, for electrification. This has caused a great deal of propaganda to be spread in Ontario supporting the nationalization program.

In the third and last article of this series it is proposed to discuss what may be expected to ensue as a result of the present railway situation in Canada and the probable effects upon the country's transportation system and upon Canada in general.

Women in Railroad Service

THE director general has received from the manager of the Woman's Service Section a statement showing the number of women employed on railroads under Federal control on January 1, 1919, April 1, 1919, and July 1, 1919. Because of the extremely heavy character of the work instructions are outstanding that women shall not be employed in station parcel room, as section laborers or truckers.

The figures show that between April 1, 1919, and July 1, 1919, there was a decrease of 4.9 per cent in the number of women railroad employees. The total number on April 1, 1919, was 86,519 and on July 1, 1919, it was 82,294. The class showing the largest shrinkage was roundhouse work, in which the decrease in the number of women employed between the two dates mentioned was 23.0 per cent. There was a shrinkage of 18 per cent both in the number of women employed in signal service. There was a falling off of only 4.4 per cent in the number of women employed in clerical positions. The largest number of women employed in railroad service continues to be engaged in clerical or semi-clerical work. The double column table shows the figures for all classes of work in which women were engaged.

NUMBER OF WOMEN EMPLOYED AND CHARACTER OF EMPLOYMENT (CLASS I ROADS)

Classes of Employees	Eastern territory			Southern territory			Western territory			Total			Per cent increase or decrease Apr. 1 to July 1	
	Jan. 1	Apr. 1	July 1	Jan. 1	Apr. 1	July 1	Jan. 1	Apr. 1	July 1	Jan. 1	Apr. 1	July 1	Increase	Decrease
1. Attendants	1,043	775	724	61	75	91	712	576	460	1,816	1,426	1,275	....	10.6
2. Bridge and lock tenders	....	....	19	....	3	....	1	....	....	1	3	19	....	....
3. Car Department	695	492	491	143	96	42	687	508	398	1,525	1,096	931	....	15.1
4. Clerical or semi-clerical	41,224	36,674	34,570	8,318	8,079	7,499	25,202	22,795	22,533	74,744	67,548	64,602	....	4.4
5. Cleaning	3,178	2,689	2,764	856	740	613	1,437	1,323	1,297	5,471	4,752	4,674	....	1.6
6. Elevator operators	63	64	60	14	12	11	23	24	25	100	100	96	....	4.0
7. Messenger service	509	406	349	22	12	15	223	206	198	754	624	562	....	9.9
8. Personal service	1,371	963	936	354	344	283	1,138	1,120	1,185	2,863	2,427	2,404	....	.9
9. Roundhouse work	588	307	240	141	73	25	561	399	330	1,290	779	595	....	23.6
10. Shop work	2,047	848	745	219	128	116	588	356	224	2,854	1,332	1,085	....	18.5
11. Signal service	221	159	127	3	5	4	10	7	7	234	171	138	....	18.7
12. Station agents, assistants, agt. operators	349	349	313	370	363	393	455	489	428	1,174	1,201	1,134	....	5.7
13. Supervisors of women employees	63	46	47	8	7	6	34	35	33	105	88	86	....	2.3
14. Switch tenders and other yard work	35	20	17	2	....	....	....	8	9	37	28	26	....	7.1
15. Telegraph operators	1,166	796	690	171	129	116	1,250	1,043	962	2,587	1,968	1,768	....	10.2
16. Telephone operators (Train orders)	1,090	808	772	156	97	71	1,036	779	734	2,282	1,684	1,577	....	6.4
17. Train service	94	80	71	....	....	....	....	....	....	94	80	71	....	11.3
18. Warehouse and docks	378	125	138	130	82	89	214	159	181	722	366	408	11.5	....
19. Watchwomen	662	519	507	10	16	12	49	53	46	721	588	565	....	3.9
20. Other service	199	129	122	34	34	44	102	95	112	335	258	278	7.8	....
Total	54,975	46,249	43,702	11,012	10,295	9,430	33,722	29,975	29,162	99,709	86,519	82,294	....	4.9

Freight rates will be one of the subjects which will be discussed at the annual convention of the Michigan State Horticultural Society at the Hotel Statler, Detroit, on December 3, 4 and 5. Among those who will address the convention are F. B. Coombs, secretary of the Michigan Traffic League; former governor Charles S. Deneen of Illinois and R. G. Phillips, secretary of the International Apple Shippers' Association, Rochester, N. Y.

Bridge and Building Men Meet in Cleveland

Twenty-Ninth Annual Convention Had Record Attendance and Interest in Papers and Discussions.

THE AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION met for its twenty-ninth annual convention at the Hotel Statler, Cleveland, on October 21-23 inclusive. Over 250 members were in attendance, the largest number in the history of the association, while the interest in the reports and discussions was equally high. Over 80 new members were received, a larger number than in any previous year. The report of the secretary-treasurer showed a balance in the treasury of $1,328, an increase of $300 over last year.

The convention was called to order by Lee Jutton (C. & N. W.) president, who introduced D. C. Moon, assistant to the federal manager of the New York Central at Cleveland. In welcoming the association to that city Mr. Moon referred to his contact with bridge and building men for over 40 years. He emphasized the necessity for the display of sound judgment in the construction and maintenance of bridges which may cost $1,000 or more per lineal foot while the earnings are no greater than for a similar stretch of track costing $5 per foot. He stated that as between so-called practical "horse sense" and technical or book knowledge, he would select a man with the former qualifications for the majority of positions. He urged members to combine these qualifications and to study formulae, for they must be used, but not to forget the practical phases of the work.

Report on Bridge Inspection Methods

There are, generally speaking, two kinds of inspection of bridges, one for the detection of defects involving immediate safety, and the other for the detection of waning serviceability. Since the first is primarily a matter of constant patrol of the railway lines, the second is the subject of this investigation. What is herein contained pertains exclusively to the matter of inspection as involved in current maintenance from year to year.

Metal Bridges

While climatic conditions have a marked effect on the durability of metal bridges, from the replies to a questionnaire received from 40 roads with an aggregate mileage of 90,000, no general statement can be made that territorial location is responsible in any way for the methods used in inspection. It can be stated generally that an annual inspection of metal structures is more generally in effect than that of any other periodicity. It may also be stated that the officer conducting the inspection of metal bridges is more frequently chosen directly from the staff of the chief engineer than from any other group of officers. The motor car seems to be the most common means of locomotion for the inspection party.

By far the greater number of railways and the greater portion of the mileage represented in the replies to the committee report the use of regular forms for taking and recording notes in the field. These forms are diversified in character and extent and range from ordinary mimeograph forms to bound note books.

By far the greater number of railways make inspection of metal bridges separately for the various members. It is probable that in most cases in the inspection of metal bridges, the general appearance and the judgment of the inspector are the criteria as to whether actual measurements are necessary.

A decidedly major portion of the replies indicate that recommendations as to repairs and renewals are made at the time of inspection and are recorded with the notes, but in the case of metal bridges, it is more than likely that such recommendations are appended to the inspector's report after mature consideration of the conditions reported. While different courses of movement of the inspection reports are described in the replies, it may be said that before definite action is taken their consideration is strictly a matter for the bridge engineer with whom the reports are finally lodged.

Wooden Bridges

Entirely different results are to be expected from the effects of climate on wooden bridges than with metal structures, although railroads in the same territory differ as to the frequency of inspection. A tabulation of the returns shows the periodicity of inspection and the percentage of the total mileage reporting under that periodicity as follows:

	Per cent
Annually	41.55
Semi-annually	32.22
Three times annually	5.95
Four times annually	2.62
Six times annually	13.11
Monthly	4.55

The officer most often made responsible for bridge inspection is either the supervisor or superintendent of bridges and buildings. Nearly 75 per cent of the mileage represented in the replies customarily uses the motor car as a means of conveying the inspection party over the line, while only about 21 per cent uses regular or special trains.

Regular forms for recording inspection notes in the field are used by 85 per cent of the mileage represented in the returns to the questionnaire. The condition of each member is recorded separately by lines aggregating about 70 per cent of the total mileage reporting, but we are inclined to believe this pertinent to metal bridges only. Actual measurements are reported as being taken by 52 per cent of the reporting mileage, while general appearance and judgment are used by the remainder, viz., 48 per cent. By far the larger portion of the lines record in the notes recommendations as to repairs and renewals at the time the notes are taken.

General practice is about evenly divided as to giving authority to the inspector to order repairs or replacement in distinction from simply making recommendations as to these matters.

Conclusions

1. A well organized plan of thorough and periodical bridge inspection should be in effect on all railroads. Inspection should preferably be made semi-annually and in any event not less frequently than annually.

2. The inspector should be particularly fitted by training and experience for the work, technical education and training being requisite for metal bridges and both judgment and experience for wooden structures.

3. Motor cars afford the best means of conveying the inspection party over the line.

4. Such tools, either special or standard, as he may consider useful for his purpose should be furnished the inspector.

5. Special inspection forms for taking and recording notes are essential. Adequate provision should be made for reporting the condition of bridge members individually or by groups and classes, dependent upon the facts disclosed by the examination.

6. Sufficient assistance to insure the thorough and com-

prehensive examination of structures inspected should be supplied.

7. Where necessary to determine the extent of the deterioration, actual measurements of members should be made.

8. Recommendations of the inspector as to corrective measure which should be applied to observed conditions are not only desirable but practically necessary. These recommendations should be recorded in the notes at the time of inspection and upon its completion should be followed up through proper channels for necessary action thereon.

9. The inspector should be vested with authority to order through proper channels the correction of any imminently unsafe conditions discovered.

10. Prescribed limitations in stress should, if possible, be established, especially for metal bridges.

11. The general program of inspection can best be formulated by the individual railroad and must needs be developed by a consideration of the operating organization in vogue, methods of effecting repairs and renewals and the number, magnitude and character of bridges maintained.

12. At least one complete counterpart of all notes, recommendations, records and papers pertaining to the inspection and corrective measures applied as a result thereof should be kept in one file of ready access.

The report was signed by Arthur Ridgway, (D. & R. G.) chairman; J. S. Huntoon, (M. C.); J. H. Johnston, (G. T.); Herbert C. Keith, (cons. engr.); G. W. Rear, (S. P.); J. L. Winters, (S. A. L.).

Discussion

This report brought out active discussion. G. W. Rear (S. P.) described the system followed on that road in inspecting over 715,000 lin. ft., of wooden structures. To promote uniformity of inspections over the system, inspectors are employed throughout the year, working on the Southern lines in the winter and the Northern lines in the summer. These inspectors are accompanied by the division engineer, division bridge inspector and division bridge supervisor on their respective territories. They examine every structure on the line and recommendations for their repair or renewal are agreed upon at the time, these recommendations being subject to review in the general office to bring them within the limits of available appropriations. Copies of the recommendations are also sent to the division superintendents, who prepare requests for work authorities for tranmission to the general manager for approval.

The action of the committee in dividing the subject between structures of metal and wood was criticised by Mr. Rear, who advocated their classification as between truss and stringer bridges. The action of the committee was defended by R. H. Reid (N. Y. C.) who pointed out that the nature of the deterioration of timber and metal structures is essentially different, and that they therefore require different forms of inspection.

A wide divergence of opinion was expressed regarding the frequency of inspections. Some members thought the annual inspection was all that was necessary, while others favored semi-annual inspections and C. W. Wright (L. I.) advocated making them every two or three months.

A number of those present opposed the computation of stresses in old timber too closely, one member stating that it had been his experience in the handling of a large number of structures that in almost every case the timber was found to have been in worse shape than had been anticipated.

Report on Inspection and Repair of Roofs

A roof should receive as close if not more careful inspection than any other part of a building. It should include everything on the roof, such as skylights, ventilators, flashings, gutters, eaves, troughs, adjoining masonry, etc.

A supervisor should always make a thorough inspection of the masonry and fire walls adjoining the roof, because the joints in the coping and brick work become so washed out within a few years, that water percolates down inside the wall, resulting in a report of a leak in the roof for which the roof proper is in no way responsible. The remedy is to remove the coping, repair and point up mortar joints in brick, lay in a damp-proofing course of prepared roofing, and replace the coping, pointing it up with a plastic bituminous cement. Sometimes a layer of plastic cement is used instead of the prepared roofing.

Flashings are a common source of leaks; those which are supposed to be permanently cemented to the brick work are rarely found thus after a few years of exposure to the elements. Large cut nails and flashing hooks should be used freely to hold the upper edges of flashings in place. A rich cement mortar or bituminous cement should be employed in the repair work, applying it along the upper edge of the flashing.

In localities where melting ice during the day and frozen leaders during the night are a common experience, gutter heads are an active cause of leaks, which are rarely cured entirely. The flat metal portion of the gutter head should always be nailed down securely over the full thickness of the roofing and wall jointings; then the flat metal should be covered with solid moppings of felt and pitch, carried back at least 18 inches from the opening. If the metal is not closed in on both sides, the expanding ice in the downspout or leader will surely break the roofing away from it while it is cold and brittle. Straight runs of gutter which are improperly applied underneath roofing of various sorts frequently cause trouble of the same kind. The best remedy for leader troubles is the use of inside drains with heads like the Holt roof connection, clamped securely in place without the use of nails.

Roof coverings that depend on paint or other coatings to prolong their life are apt to become neglected, creating a liability of damage or premature loss. Especially is this so in the case of railroad buildings where frequent changes are made among officers and workmen.

Wooden shingle roofs usually have to be repaired with wooden or tin shingles. When such roofs become old they are a fire menace, especially when they are in close proximity to coal-burning locomotives.

Tin roofs require soldering or patching when in need of repairs. Temporary repairs may be made by the use of tested elastic bituminous compounds while leaks of a minor nature can be checked for a time by the application of a heavy coat of paint. Tin roofs should be painted with a good mineral paint about every four years.

There are many brands of composition roofings, commonly termed prepared roofings, which are laid in sheets or from rolls. Some of these will last 10 to 15 years, while some of the cheaper grades depend on an occasional coating of some special preparation in paint form to prolong their life. Such roofs can be patched successfully, this being about the only manner in which repairs can be made.

The last few years have seen the introduction of the asphalt shingles. When laid on suitable inclines to shed water it rarely leaks because there are always two and sometimes three thicknesses of roofing material.

There are all sorts of gravel roofs; many of them have been bought too cheaply. A three-ply roof made of light felt, put together with 60 lb. of pitch and tar, and covered with possibly 100 lb. of gravel, will need repairs inside of three years. A five-ply roof made of 70 lb. of felt and 100 lb. of pitch, properly graveled in will last seven years. The addition of 25 lb. of pitch at the time the roof is built, will make it last from 10 to 15 years. A roof containing about 80 lb.

of felt and 150 to 250 lb. of pitch, depending upon whether the roof deck is of wood or concrete (as recommended in the Barrett specification), will surely outlast its 20-year guarantee, and probably be good for 35 or 40 years.

Standard gravel roofs or makeshift gravel roofs can profitably be recoated at any time before the felt becomes exposed and begins to turn brown. The method is to sweep up all roof gravel with a stiff brush, pour on an ample amount of coal-tar pitch, and then resurface with clean gravel. It is safe to use the old gravel if it is screened, but a considerable amount of new material must be added to the old in order to secure a good job.

If the roof has been neglected until leaks develop, it is necessary to go over it carefully after it is swept up and in all places where cracks or serious rotting of the felt is found, such places should be covered with at least three thicknesses of felt and pitch, leaving margins in successive layers of the repair of at least four inches all around before the recoating is done. Most roof troubles develop angles where the roofs join walls, scuttles, skylights, etc. Two or three layers of solidly-mopped pitch and felt in such places never do any harm, and assist in making a good job.

About the only way to repair clay tile roofs is to replace the broken tile with new material of the same kind. When such roofs are constructed originally a number of the tile should be laid aside for repairs, especially if the material is of an odd design and not readily obtained in the market. The repair of tile roofs requires skilled labor. Large precast cement tile are also coming into use, being applied to steel frames for inclined roofs.

A number of roofs have been laid in recent years with hard shingles made from a composition of asbestos, cement, etc., more nearly resembling slate in size and degree of hardness. In case of failure they must necessarily be replaced with new material of the same kind, if second-hand pieces are not available. These shingles have not been in use long enough to determine their lasting qualities.

Slate roofs are usually repaired by substituting new slate and this can be done readily because standard sizes are always available. A good slate roof having greater than half pitch will last many years without repairs.

The report was signed by M. J. Flynn, (C. & N. W.), chairman: C. A. Lichty, (C. & N. W.); W. F. Meyers, (C. & N. W.).

Discussion

The discussion of this report centered largely about the use of plastic cements for the repair of roofs of various types. Some members told of the use of these cements successfully on metal roofs, while others stated that while the cement had eliminated leakage for 18 months to 2 years, at the end of that time it had been found that the metal itself had been destroyed. The use of high grade built up roofs on slopes of moderate pitch was advocated by several members who reported excellent service from this form of construction, where it was properly installed originally.

Report on Methods and Equipment in Renewing Timber Bridges

A committee of which Mr. Johnson (I. C.) was chairman, submitted an extended report on the organization of gangs and the methods followed in the renewal or repair of piles, caps, stringers and ties singly and also incidental to the general renewal of the entire bridges. This report discussed in detail the various steps in the carrying out of this work.

The discussion centered largely about the advisability of renewing ties on bridges singly or out of face. Referring to structures on which tie plates are not used, E. K. Barrett (F. E. C.) advocated inserting a number of new ties together because of the difficulty of securing an even bearing for the rail when they are applied singly between old rail-cut ties. One member described the practice of turning the ties over to overcome this objection, while another stated that it was his practice to frame each tie to the proper height in the shop before shipment to the bridge, in order that it might then be installed between ties which were rail-cut.

Internal Combustion vs. Steam Engines

A paper of Internal Combustion Versus Steam Engines for Pumping Water, presented by C. A. Lichty, was similar to one which he read before the convention of the International Railway Fuel Association in Chicago in May, and abstracted in the *Railway Age* of June 6.

In the discussion of this paper it was evident that there is a wide difference of opinion regarding the merits of these two forms of pumping equipment. Some members favored steam units because of the less skilled attendance necessary, while others advocated oil engines because of their greater economy at small stations. L. A. Cowsert (C. N. O. & T. P.) stated that it was the present practice of that road to install oil engines whenever making a change in pumping station equipment and that one of the large economies has been found to result from the delivery of fuel oil from the tracks to isolated stations by gravity through pipe lines, instead of hauling coal by wagons, as had formerly been necessary.

Report on Painting Metal Railway Structures

The greatest enemy of steel is rust and to make a job of painting successful the rust must be thoroughly removed. All of the 17 roads replying to a questionnaire, specify scrapers, wire brushes, chisels, and bars for this purpose, and three use the sand blast occasionally. There can be no doubt that the sand blast is by far the most thorough method of cleaning, but the cost is excessive and it is not generally used on that account. Some of the roads specify sledges and bars for the removal of rust, but it would seem that a structure that is so rusty as to require such heroic treatment would be seriously weakened and would indicate faulty methods of inspection.

All are agreed that the first coat of paint should be applied as soon as possible after cleaning, providing the steel is dry, as paint will not adhere to a wet surface. The use of sprayers is not advised, 16 of the roads reporting unfavorably while one says it believes it to be as good as brushing but remarks that he has had no experience. The operation of brushing is of vital importance and should receive more attention than it usually does. In painting steel only enough paint should be used to cover and that should be thoroughly brushed, mixing it with whatever rust or other impurities may have been left on the surface and working it into all crevices.

Thirteen of the roads favor red lead in some form for the primer. One favors the addition of white lead in the proportion of one-third white to two-thirds red; another advocates the addition of one per cent of lamp black with the idea of filling voids in the coarser red lead and tending to make the paint denser and more impervious to moisture. A proprietary paint is used by four.

For the succeeding coats the preference is about equally divided between lamp black and graphite, while two roads report the use of brown mineral with satisfactory results.

The method which seems to be giving the greatest satisfaction and to be followed most universally is to prime with red lead, the second coat to consist of a mixture of red lead and lamp black and finish with lamp black or graphite. Only one of the roads reports the use of any other oil than

linseed; in this case soya bean oil receives favorable mention. The addition of about six per cent of turpentine is recommended in nearly all cases to assist in penetration and to give the paint better spreading qualities. This is not to be considered a substitute for linseed oil, but is added to the paint for a specific purpose.

The materials used on water tanks and coaling stations do not differ materially from that used on bridges, except that in a few instances the inside surfaces of water tanks have been painted with hot tar. No satisfactory results have been reported from the use of special coatings on coaling stations, ordinary bridge paint giving as much protection against the fumes of engines as any special preparation that has been tried. No preparation to be used as a paint can give adequate protection to overhead members subject to the direct blast from locomotive smokestacks; all such members are better protected by a cement covering or a suspended slab of asbestos or other indestructible material.

The question of painting galvanized iron brought out a great many formulas for washes to be applied to the iron before it was painted. These washes are supposed to prevent the paint from peeling, but none of them have any very enthusiastic advocates. The most successful method seems to be the weathering of the iron until the zinc coating is removed. If it is necessary to remove the zinc coating from the iron before it can be painted successfully, the zinc may as well be saved and plain iron used instead. The following chemicals are quoted as being used on galvanized iron for the above purposes: sal soda, sal ammoniac, hydrochloric acid, copper chloride, aqua ammonia, copper sulphate, nitric acid, benzine and turpentine.

The report was signed by C. T. Musgrave (O. S. L.), chairman; C. Ellenger (I. C.); E. S. Airmet (O. S. L.); F. Gaunt (O. S. L.); B. D. Rich (S. P.); J. R. Shean (Pac. El.).

Discussion

The discussion of this report centered largely around the necessity of securing mechanics of the proper experience if good results are to be obtained. I. W. Swaney, (Sherwin-Williams Company) presented a discussion of painting practices, in which he made a plea for the standardization of paints and paint specifications, stating that this would cut the cost of manufacture from 25 to 50 cents per gallon.

Report on the Economical Use and Storage of Fuel

To avoid undue deterioration, coal should not be stored to exceed 60 days. The storage supply should be located outside of and at a convenient distance from the pump house, away from other buildings and near an unloading track where one is available so that coal may be handled direct from the cars. To avoid the retention of some portion of the coal in the bin for an indefinite time there should be two openings to remove the coal.

Steam, water and other wastes must be prevented. Pump houses should be built with a view to warmth. To minimize heat losses, boilers, steam pipes and the steam ends of pumps should be insulated where the saving will justify the expense.

Beginning at the grates upon which the fuel bed rests, see that the air spaces are properly proportioned to avoid the loss of combustible material into the ash pit. This will depend on the kind of coal used. Study the fuel with this point in mind. Five per cent is not an unusual loss from this cause.

The amount of grate surface is important, as it determines the rate of combustion. For power purposes in handfired plants do not permit the rate of combustion to fall below 15 lb. of coal per square foot of grate surface per hour, or go above 28 lb. with bituminous coal.

With settings tight to prevent the infiltration of air, heating surface clean, radiation losses reduced by proper covering, piping and steam mains lagged, engine valves tight and properly set, all condensation returned to the feed-water heater a good start will have been made in fuel conservation. However, merely placing the plant in good physical condition will not suffice. Conditions change from day to day, from hour to hour, even from moment to moment. These changes must be interpreted, and the degree of intelligence with which they are interpreted marks the degree of success which will be realized in fuel saving. A good plant poorly operated will show low efficiency, while a poor plant skillfully operated will sometimes show a relatively high efficiency.

Unlike coal, oil, if stored in closed tanks, does not deteriorate when standing nor is it subject to spontaneous combustion; but the greatest care should be given to its storage, as oil and its vapors are very searching and extreme precautions are advisable, though with proper ventilation of the tanks the danger from fire is nil.

Steel tanks for the storage of oil may be secured in all sizes and in accordance with any particular specification, but it is more economical and satisfactory to have sizes and specifications conform to the gage and sizes of sheets commonly carried in stock by the manufacturers, as specifying tanks of special size causes waste through cutting sheets rolled to standard sizes and increases the cost of storage.

Partly or wholly burying oil tanks in the ground is a common practice. However, the ultimate economy is questionable, as the depreciation of the shell from soil corrosion may be rapid, and leaks, unless relatively large, are hard to detect and expensive to repair.

Oil losses by seepage from properly constructed steel and concrete tanks can be considered practically negligible. However, the volume of useful hydrocarbon products lost through evaporation in oil storage is a considerable item, the loss, of course, being greater in the lighter oils than in the heavy oils, although there is a continued stream of the light hydrocarbons escaping from its surface as long as it remains in storage, even with oil of low gravity. There are two general rules to follow to prevent evaporation losses: (1) keep the temperature of the oil in the tank as low as possible, and (2) make the contalners as tight as practicable.

The report was signed by F. M. Case, (C. & N. W.), chairman; C. R. Knowles, (I. C.); E. A. Demars, (O. S. L.); A. D. McCallum, (C. H. & D.).

Discussion

A number of members pointed out losses resulting from the extended storage of fuel. A. W. Harlow (Erie) described the emphasis placed upon economical firing of pumping plants by the officers of that road, as a result of which the jurisdiction of supervisors of locomotive operation has been extended over pumping plants insofar as this phase of the work of the pumper is concerned. The operators of pumping stations are required to fire a shovelful at a time.

Railway Fire Protection Equipment

By C. R. Knowles
Superintendent Water Service, Illinois Central

The five principal fire extinguishing agents in use on railroads are bicarbonate of soda, caustic soda and sulphuric acid, carbon-tetrachloride, dry sand and water.

Bicarbonate of soda is useful only in incipient fires and is of but little value as a fire extinguisher.

Chemical fire extinguishers using soda and acid are usually furnished in the 2½-gal. hand type and in the 40-gal. type mounted on wheels. The hand type is one of the best fire extinguishers known for small incipient fires. As many

of them are located at points where there is no other fire protection it is important that they be kept in perfect order at all times. They should be discharged, cleaned and recharged at least once each year, the date of recharging to be marked on the tag attached to the extinguisher. At least two extra charges should be on hand for each extinguisher.

The care of extinguishers should be assigned to some particular man at each point as a division of responsibility for their condition will lead to neglect. They should be inspected weekly; this inspection should include a careful examination of the nozzle, hose and hose connection and the renewal of defective parts as soon as discovered.

Carbon-tetrachloride is particularly effective on fires in hazardous liquids, other rapidly burning materials, electrical fires and other fires not readily extinguished by water. The extinguisher for using this liquid is usually of the one-quart pump type and, on account of the small size, is of value only in incipient and small fires. The freezing point of carbon-tetrachloride is 25 to 50 degrees below zero, therefore, it is very desirable where low temperatures prevail. These extinguishers should receive the same care as other chemical extinguishers and should be kept full of liquid at all times. A reserve supply of liquid for refilling should also be available.

Sand is useful chiefly in oil fires and should be contained in pails or properly constructed sand boxes with scoops for throwing. The sand should be clean and dry and the supply should be located near a doorway in order that it may be accessible.

Water is, of course, the principal agent used in fighting fire, all other agents being of value chiefly on incipient fires, or in chemical, oil and electrical fires which are usually limited in extent. Therefore, from whatever source water is obtained for fire purposes, the supply should be ample and constant. Second only to an ample supply of water is the importance of adequate facilities, properly constructed and so located as to permit fighting the fire with a minimum of delay.

The fire underwriters have laid down extensive rules and regulations governing the design, location, maintenance and operation of pumps used for fire purposes, which rules are well known. Unfortunately there are but few pumps used exclusively for fire protection on railroads, the average pump being designed and used primarily for general service pressure. Fire protection being incidental, therefore, it is impractical to apply these regulations to all pumps without impairing the service for which they are primarily designed. Where service pumps are also used for fire protection their operation should conform as closely as possible to the rules laid down for fire pumps.

Pipe lines serving fire hydrants and fire connections should be independent of general service where possible, but if a part of the general service system they should be so constructed and arranged that service connections can be cut off and full fire pressure maintained on hydrants and hose connections.

Fire hydrants should be of an accepted type offering the lowest resistance to the flow of water. Ground or outside hydrants should be of the two-way type and should be designed to drain automatically when the valve is closed, to prevent freezing. They should be painted white so they may be located readily at night. They should be inspected frequently to see that they are in proper condition and that they drain properly to prevent freezing. Under no circumstances should fire hydrants be used for other than fire purposes. Hydrant wrenches and spanner wrenches for tightening hose should be located conveniently and in sufficient number to provide at least one for each hydrant.

The number of water barrels and buckets recommended is as follows:

In passenger stations, three pails for buildings of ordinary size, increasing the number by one pail for about each 500 sq. ft. of floor space over the first 2,000 sq. ft.

In freight stations at least one barrel and two pails for buildings of ordinary size, increasing the number in larger buildings by one barrel and two pails for each additional 3,000 sq. ft. of floor space over the first 3,000 sq. ft. so as to make them readily accessible to all parts.

In combined passenger and freight stations, one barrel and two fire pails to be placed in the freight room, increasing the number in larger buildings as indicated for freight stations.

In shop buildings, one barrel and two pails to be distributed for about each 3,000 sq. ft. of floor space.

In warehouses, two pails for a floor space of 1,000 sq. ft. or less, increasing the number by one pail for each additional 500 sq. ft.

Barrels to have a capacity of not less than 50 gal.

When fire barrels and pails are located where there is a liability of the water being frozen in cold weather, it is recommended that calcium chloride or salt be placed in each to retard freezing. The density of the solution required will depend upon existing temperatures.

Fire hose is one of the most important fire-extinguishing agencies, and it should be of the best material and workmanship. It should always be in perfect working order and at all times properly cared for. Fire hose is subjected to a severe class of service, the importance of which makes it essential that the utmost care be given to the quality of the materials and the character of the workmanship employed in its manufacture. By purchasing only the best hose and giving it the small amount of attention suggested, the greatest practicable durability will be assured. Experience has shown that a good cotton rubber-lined hose, properly cared for, will frequently last 10 or 15 years

Discussion

C. W. Wright (L. I.) urged that every employee using any form of fire protection equipment be required to make a report to the proper officer immediately, in order to insure that this equipment is at all times ready for service. The question of the location of water barrels on high bridges was also discussed by G. W. Rear (S. P.) who stated that it had been found on that road that other than railway employees would not venture out to barrels placed on the end of caps on high structures to secure water with which to put out a small fire. For this reason it is the practice of this road to build platforms at the level of the track on which the barrels are placed.

Closing Business

At the closing session Thursday morning the following subjects were selected for consideration by committees during the next year: (1) Filling Bridges with Special Reference to Maintenance of Structures During Filling; (2) Standard Forms for Bridge Inspection; (3) Abuse of Treated Timbers; (4) Repair and Maintenance of Tank Hoops; (5) Maintenance and Repair of Freighthouse Floors; (6) Use of Electricity for Pumping Water; (7) Application of Paint for Spraying; (8) Maintenance of Timber Docks; (9) Reclamation of Bridge, Building and Water Service Materials.

The following officers were selected to serve for the ensuing year:

President, F. E. Weise, chief clerk to chief engineer, C. M. & St. P., Chicago; first vice-president, W. F. Strouse, Baltimore, Md.; second vice-president, C. R. Knowles, superintendent of water service, I. C., Chicago; third vice-president, Arthur Ridgway, assistant chief engineer, D. & R. G., Denver, Colo.; fourth vice-president, J. S. Robinson, division

engineer, C. & N. W., Chicago; secretary-treasurer, C. A. Lichty, inspector, purchasing department, C. & N. W., Chicago; members of executive committee: J. P. Wood, supervisor bridges and buildings, P. M., Saginaw, Mich.; A. B. McVay, supervisor bridges and buildings, L. & N., Evansville, Ind.; J. H. Johnston, superintendent bridges and buildings, G. T., Montreal, Que.; E. T. Howson, Western editor, *Railway Age,* Chicago; C. W. Wright, master carpenter, L. I., Jamaica, N. Y., and G. A. Manthey, assistant superintendent bridges and buildings, D. S. S. & A., Marquette, Mich.

Atlanta, Ga., was selected as the location for the next convention.

On Wednesday afternoon the members made an inspection of the Orange avenue freight terminal of the New York Central and of the ore handling docks of the Pennsylvania lines. Following the adjournment of the convention on Thursday noon, a party visited the plant of the Goodyear Tire & Rubber Company at Akron, Ohio. The annual dinner of the Bridge & Building and the Supply Men's associations was held at the Statler Hotel on Wednesday evening.

Supply Men's Exhibit

The Bridge and Building Supply Men's association held an exhibit in a room adjacent to the convention hall, in which 34 firms presented literature, photographs and models of their equipment. The officers of the association for the past year were: President, P. J. Jacobs, H. W. Johns-Manville Company, Chicago; vice-president, Tom Lehon, the Lehon Company, Chicago; treasurer, C. E. Ward, United States Wind Engine & Pump Company, Batavia, Ill.; secretary, M. J. Trees, Chicago Bridge & Iron Works, Chicago; members executive committee, C. L. Cockrell, Philip Carey Company, Chicago; E. T. Howson, *Railway Age,* Chicago; G. R. McVay, The Barrett Company, Chicago; W. O. Washburn, American Hoist & Derrick Company, St. Paul, Minn.; A. J. Filkins, Paul Dickinson Company, Inc., Chicago.

The following is a list of the firms represented, with the nature of their exhibits and the names of their representatives:

American Hoist & Derrick Company, St. Paul, Minn.; W. O. Washburn and F. J. Johnson.

American Tar Products Company, Chicago; P. J. Griffiths and S. H. Fields.

American Valve and Meter Company, Cincinnati, Ohio; Fenner non-freezable drop spout, Poage style H water column; J. T. McGarry and D. J. Higgins.

Barrett Company, New York City; Holt vent and leader connection; G. R. McVay and A. E. Thompson.

Bird & Co., Chicago; Mr. Caton and Mr. Inwood.

Buda Company, Chicago; Bridge gang motor car; H. C. Beebe and G. E. Bryar.

Chicago Bridge and Iron Works, Chicago; Illuminated photographs; H. C. Brown and F. L. Cook.

Detroit Graphite Company, Chicago; L. D. Mitchell, J. J. Hogan, W. B. Waugh and W. E. Bates.

Devilbiss Manufacturing Company, Toledo, Ohio; W. F. Gradolph and C. D. Ward.

Paul Dickinson Company, Chicago; Arthur J. Filkins.

Dixon (Joseph) Crucible Company, Jersey City, N. J.; Dixon graphite paint; H. A. Nealley and N. C. Cameron.

Duff Manufacturing Company, Pittsburgh, Pa.; E. A. Johnson.

Fairbanks, Morse & Co., Chicago; catalogues; F. M. Condit, H. E. Vogel, C. B. Skelton, B. S. Spaulding, A. A. Taylor, H. E. Vergasen, Stephen Smith, J. C. Flanagan, G. Howard, G. Lang, F. M. Gardner and G. J. Akers.

Heath and Milligan Manufacturing Co., Chicago; G. W. Lindholm and W. H. Pratt.

High Grade Manufacturing Co., Cleveland, Ohio; Gilso cement; S. A. Baber and J. N. Kina.

Ingersoll, Rand & Co., New York City; Pneumatic riveter, drill and bridge repair outfit; J. N. Thorpe, Jr., and George C. Williams.

H. W. Johns-Manville Company, Chicago; Asbestos roofing and pipe covering; C. E. Murphy, W. L. Laurence, J. E. Meek and H. B. Sewell.

The Lehon Company, Chicago; Mule-Hide roofing and shingles; Tom Lehon, D. B. Wright and Chas. V. Eades.

Luther Grinder Manufacturing Company, Milwaukee, Wis.; Tool grinders; C. R. Pfeifer and Bert St. Germain.

Massey Concrete Products Company, Chicago; G. H. Redding and A. E. Humphrey.

Mudge & Co., Chicago; Jean K. Vanatta.

National Water Main Cleaning Co., New York City; Burt B. Hodgman.

Nichols (George P.) & Bros., Chicago; Geo. P. Nichols.

Patent Vulcanite Roofing Company, Chicago; Asphalt shingles and roofing; A. J. Van Page.

Patterson & Sargent Company, Cleveland, Ohio; G. W. Anderson, J. K. Patterson and W. H. McBride.

Philip Carey Company, Chicago; Roof coating and shingles; C. L. Cockrill and F. R. Schueler.

Railway Age, New York City; E. T. Howson, H. H. Marsh and B. J. Wilson.

Railway Review, Chicago; Harold A. Smith and Charles L. Bates.

Sherwin-Williams Company, Cleveland, Ohio; George G. Mowat and E. W. Lutes.

T. W. Snow Construction Company, Chicago; T. W. Snow.

Standard Asphalt Company, Chicago; R. F. Trumbull and E. L. Hedrick.

U. S. Wind Engine and Pump Co., Batavia, Ill.; C. E. Ward.

Upson-Walton Co., Cleveland, Ohio; H. B. McCreary and E. H. Porter.

Volkhardt Company, Inc., Stapleton, N. Y.; Yard and cinder pit hydrant; W. Volkhardt.

The supply men elected the following officers to serve for the ensuing year:

President, Tom Lehon, the Lehon Company, Chicago; vice-president, C. E. Ward, United States Wind Engine & Pump Company, Batavia, Ill.; treasurer, M. J. Trees, Chicago Bridge & Iron Works; secretary-treasurer, G. R. McVay, the Barrett Company, Chicago; members executive committee, E. T. Howson, *Railway Age,* Chicago; Charles Thulin, G. W. Anderson, Patterson & Sargent Company, Cleveland, O.; D. J. Higgins, American Valve & Meter Company, Cincinnati, O.; F. M. Condit, Fairbanks, Morse & Company, Chicago.

September Earnings Show Some Surplus

DIRECTOR GENERAL HINES has announced that detailed statistics which will shortly become available of the operating results for the month of September of practically all Class I railroads and large terminal companies in federal operation will indicate that, after including in September the estimated back pay for shopmen for the five months, May to September, inclusive, the net operating income for the month of September, 1919, was about $78,000,000. On this basis the net gain to the government, for the month of September, after allowing for one-twelfth of the annual rental due the railroad companies whose railroads are covered by these statistics, is $3,000,000, but if there be charged against September only its own part of the shopmen's back pay, the net gain to the government for the month of September is about $19,000,000. If the results of operation for the five months from May to September should be restated so as to apply to each of these months its approximate proportion of this increase in pay for the shopmen, the net gain or net loss for the months in question would be approximately as follows:

	Net Gain	Net Loss
May	.....	$37,642,128
June	.....	26,031,860
July	.....	2,031,547
August	$12,397,112	.....
September	19,000,000	.....

The net gain or loss for these same properties by months of the present calendar year on the basis of the amounts as they stand, and therefore including in the figures for September the increased wages for shopmen for the months from May to September, inclusive, is as follows:

Month	Net gain or loss to the Government after allowing for one-twelfth of the annual rental: Net gain	Net loss
January	.....	57,782,557
February	.....	65,430,850
March	.....	64,881,856
April	.....	48,757,056
May	.....	33,642,128
June	.....	22,031,860
July	$1,968,453	.....
August	16,397,112	.....
September (Estimated)	3,000,000	.....
Net loss for nine months		$371,160,742

Principal Provisions of the Esch Railroad Bill

Text of the More Important Sections of the Bill as Passed by the House on November 17

WASHINGTON, D. C.

FOLLOWING IS THE COMPLETE TEXT of some of the more important sections of the Esch bill as it was passed by the House and particularly those which were radically changed, by amendments adopted by the House, from the form in which the bill was reported by the committee on interstate commerce, of which a synopsis was given in Chairman Esch's report published in our issue of October 10, (printed November 26).

Termination of Federal Control

Sec. 200 (a) Federal control shall terminate (1) at the end of the last day of the month in which this Act is passed, if this Act is passed on or before the fifteenth day of the month, or (2) at the end of the last day of the month following the month in which this Act is passed, if this Act is passed after the fifteenth day of the month; and the President shall then relinquish possession and control of all railroads and systems of transportation then under Federal control and cease the use and operation thereof.

(b) Thereafter the President shall not have or exercise any of the powers conferred upon him by the Federal Control Act relating—

(1) To the use or operation of railroads or systems of transportation;

(2) To the control or supervision of the carriers owning or operating them, or of the business or affairs of such carriers;

(3) To their rates, fares, charges, classifications, regulations, or practices;

(4) To the purchase, construction or other acquisition of boats, barges, tugs and other transportation facilities on the inland, canal, or coastwise waterways; or (except in pursuance of contracts or agreements entered into before the termination of Federal control) of terminals, motive power, cars, or equipment, on or in connection with any railroad or system of transportation;

(5) To the utilization or operation of canals;

(6) To the purchase of securities of carriers, except in pursuance of contracts or agreements entered into before the termination of Federal control; or

(7) To the use for any of the purposes above stated (except in pursuance of contracts or agreements entered into before the termination of Federal control, and except as provided in section 202) of the revolving fund created by such Act, or of any of the additions thereto made under such Act, or by the Act entitled "An Act to supply a deficiency in the appropriation for carrying out the Act entitled 'An Act to provide for the operation of transportation systems while under Federal control, for the just compensation of their owners, and for other purposes,' approved March 21, 1918," approved June 30, 1919.

(c) Nothing in this Act shall be construed as affecting or limiting the power of the President in time of war (under section 1 of the Act entitled "An Act making appropriations for the support of the army for the fiscal year ending June 30, 1917, and for other purposes," approved August 29, 1916) to take possession and assume control of any system of transportation and utilize the same.

Government-Owned Boats on Inland Waterways

Sec. 201. On the termination of Federal control, as provided in section 200, all boats, barges, tugs and other transportation facilities, on the inland, canal and coastwise waterways (hereinafter in this section called "transportation facilities") acquired by the United States in pursuance of the fourth paragraph of section 6 of the Federal Control Act (except the transportation facilities constituting parts of railroads or transportation systems over which Federal control was assumed) are transferred to the Secretary of War, who, through the Chief of Engineers, shall utilize or operate such transportation facilities, and assume and carry out all contracts and agreements in relation thereto entered into by or through the President in pursuance of such paragraph prior to the time above fixed for such transfer. All payments under the terms of such contracts shall be made out of moneys available under the provisions of this Act for adjusting, settling, liquidating and winding up matters arising out of or incident to Federal control. Moneys required for such payments shall, from time to time, be transferred to the Secretary of War as required for payment under the terms of such contracts. All other payments after such transfer in connection with the construction, utilization and operation of any such transportation facilities, whether completed or under construction, shall be made by the Secretary of War out of funds now or hereafter made available for that purpose.

The utilization and operation of such transportation facilities shall be subject to the provisions of the Commerce Act as amended by this Act or by subsequent legislation, and to the provisions of the "Shipping Act, 1916," as now or hereafter amended, in the same manner and to the same extent as if such transportation facilities were privately owned and operated; and all such vessels while operated and employed solely as merchant vessels shall be subject to all other laws, regulations and liabilities governing merchant vessels, whether the United States is interested therein as owner, in whole or in part, or holds any mortgage, lien, or interest therein. For the performance of the duties imposed by this section the Secretary of War is authorized to appoint or employ such number of experts, clerks and other employees as may be necessary for service in the District of Columbia or elsewhere, and as may be provided for by Congress.

Settlement of Matters Arising Out of Federal Control

Sec. 202. The President shall, as soon as practicable after the termination of Federal control, adjust, settle, liquidate and wind up all matters, including compensation, and all questions and disputes of whatsoever nature, arising out of or incident to Federal control. For these purposes and for the purpose of making the payments specified in section 201, all unexpended balances in the revolving fund created by the Federal Control Act or of the moneys appropriated by the Act entitled "An Act to supply a deficiency in the appropriation for carrying out the Act entitled 'An Act to provide for the operation of transportation systems while under Federal control, for the just compensation of their owners, and for other purposes,' approved March 21, 1918," approved June 30, 1919, are hereby reappropriated and made available until expended; and all moneys derived from the operation of the carriers or otherwise arising out of Federal control, and all moneys that have been or may be received in payment of the indebtedness of any carrier to the United States arising out of Federal control, shall be and remain available until expended for the aforesaid purposes.

Causes of Action Arising Out of Federal Control

Sec. 204. Actions at law, suits in equity and proceedings in admiralty, based on causes of action arising out of the possession, use, or operation by the President of the railroad or system of transportation of any carrier (under the provisions of the Federal Control Act, or of such Act of August 29, 1916) of such character as prior to Federal control could have been brought against such carrier, may, after the termination of Federal control, be brought against such agent or agency as the President designates to adjust, settle, liquidate and wind up matters arising out of Federal control. Such actions, suits or proceedings may, within the periods of limitation now prescribed by State or Federal statutes but not later than two years from the date of the passage of this Act, be brought in any court which but for Federal control would have had jurisdiction of the cause of action had it arisen against such carrier.

Process may be served upon any agent or officer of the carrier operating such railroad or system of transportation, if such agent or officer is authorized by law to be served with process in proceedings brought against such carrier and if a contract has been made with such carrier by or through the President for the conduct of litigation arising out of operation during Federal control. If no such contract has been made process may be served upon such agents or officers as may be designated by or through the President. The agent designated by the President to adjust, settle, liquidate and wind up matters arising out of Federal control, shall cause to be filed, upon the termination of Federal control, in the office of the clerk of each District Court of the United States, a statement naming all carriers with whom he has contracted for the conduct of litigation arising out of operation during Federal control, and a like statement designating the agents or officers upon whom process may be served in actions, suits and proceedings arising in respect to railroads or systems of transportation with the owner of which no such contract has been made; and such statements shall be supplemented from time to time, if additional contracts are made or other agents appointed.

Actions, suits or proceedings of the character above described pending at the termination of Federal control shall not abate by reason of such termination, but may be prosecuted to final judgment, substituting the agent or agency designated by the President to adjust, settle, liquidate and wind up matters arising out of Federal control.

That the period of Federal control shall not be computed as a part of the periods of limitation in actions against carriers or in claims for reparation to the commission for causes of action arising prior to Federal control.

Refunding of Carriers' Indebtedness to United States

Sec. 205. As soon as practicable after the termination of Federal control the President shall ascertain the amount of the indebtedness of each carrier to the United States, incurred for additions and betterments made during Federal control and properly chargeable to capital account, which may exist at the termination of Federal control; and (2) the amount of the indebtedness of the United States to such carrier arising out of Federal control. The amounts so ascertained shall be set off against each other to the extent permitted under any contract now or hereafter made between such carrier and the United States in respect to the matters of Federal control, or, where no such contract exists, to the extent permitted under paragraph (b) of section 7 of the standard contract between the United States and the carriers relative to deductions from compensation.

(b) Any remaining indebtedness of the carrier to the United States in respect to such additions and betterments shall, at the request of the carrier, be funded into not exceeding ten equal parts, one of such parts to be payable annually, beginning at the expiration of five years after the termination of Federal control, with interest at the rate of 6 per centum per annum from the date of funding, payable semi-annually, subject to the right of such carrier to pay, on any interest-payment day, the whole or any part of any such installment before it is due. Any carrier obtaining the funding of such indebtedness as aforesaid shall give, in the discretion of the President, such security, in such form and upon such terms, as he may prescribe.

(c) Any other indebtedness of any such carrier to the United States which may exist after the settlement of accounts between the United States and the carrier shall be evidenced by notes payable on demand, with interest at the rate of 6 per centum per annum, and secured by such collateral security as the President may deem it advisable to require.

(d) With respect to any bonds, notes or other securities acquired under

the provisions of this section or under the provisions of the Federal Control Act, the President shall have the right to make such arrangements for extension of the time of payment or for the exchange of any of them for other securities, or partly for cash and partly for securities, as may be provided for in any agreement entered into by him or as may in his judgment seem desirable.

Existing Rates to Continue in Effect

Sec. 206. All rates, fares and charges, all divisions of joint rates, and all classifications, regulations and practices in anywise changing, affecting or determining any part or the aggregate of rates, fares or charges, or the value of the service rendered, which immediately preceding the termination of Federal control are in effect on the lines of carriers subject to the Commerce Act, shall continue in force and effect until thereafter changed by State or Federal authorities, respectively, or pursuant to authority of law; but this shall not be construed as affecting the rights of any party to a proceeding, involving rates, fares, charges, classifications, regulations or practices, which has been or may be instituted under the Commerce Act or other law.

Guaranty to Railroads After Termination of Federal Control

Sec. 207. (a) When used in this section—

The term "carrier" means a carrier by railroad or partly by railroad and partly by water, (1) whose railroad or system of transpotation is under Federal control at the time Federal control terminates, or which has heretofore engaged as a common carrier in general transportation and competed for traffic with a railroad or railroads of which the President has taken and retained possession, use and control (excepting, however, from such railroads not under Federal control any street or interurban electric railway which has as its principal source of operating revenue urban, suburban, or interurban passenger traffic or sale of power, heat and light, or both) and (2) which, within sixty days after the termination of Federal control as provided in section 200, has filed with the Commission schedules embodying general increases in its rates, fares and charges;

The term "guaranty period" means the first six months after the termination of Federal control; and

The term "test period" means the three years ending June 30, 1917.

(b) The United States hereby guarantees to each carrier that its railway operating income for the guaranty period as a whole shall not be less than the average of its railway operating income for the three corresponding periods of six months each during the test period. If during such corresponding periods in the test period, averaged together, the carrier had no railway operating income, the guaranty shall be the amount by which any deficit in railway operating income for the guaranty period as a whole exceeds the deficit for the three corresponding periods during the test period, averaged together.

(c) For the purposes of this section the railway operating income for the periods during the test period corresponding to the guaranty period shall be computed in the manner provided for in section 1 of the Federal Control Act.

(d) In computing railway operating income for the guaranty period for the purposes of this section—

(1) Debits and credits arising from the accounts, called in the monthly reports to the Commission equipment rents and joint facility rents, shall be included, but debits and credits arising from the operation of such street electric passenger railways, including railways commonly called interurbans, as are not under Federal control at the time of termination thereof, shall be excluded;

(2) Proper adjustments shall be made (a) in case any lines which were, during any portion of the period of Federal control, a part of the railroad or system of transportation of the carrier, and whose railway operating income was included in such income of the carrier for the test period, do not continue to be a part of such railroad or system of transportation during the entire guaranty period, and (b) in case of any lines acquired by, leased to, or consolidated with, the railroad or system of transportation of the carrier at any time since the end of the test period and prior to the expiration of the guaranty period, for which separate operating returns to the Commission are not made in respect to the entire portion of the guaranty period;

(3) There shall not be included in operating expenses, for maintenance of way and structures, or for maintenance of equipment, more than an amount fixed by the Commission. In fixing such amount the Commission shall so far as practicable apply the rule set forth in the proviso in paragraph (a) of section 5 of the "standard contract" between the United States and the carriers (whether or not such contract has been entered into with the carrier whose railway operating income is being computed), except that instead of taking the whole of the test period for the purposes of comparison there shall be taken the periods during the test period corresponding to the guaranty period; and

(4) The Commission shall require the restatement of the operating expenses (other than for maintenance of way and structures, or maintenance of equipment) for the guaranty period, to the extent necessary to correct any abnormal charge to such expenses for such period.

(e) The Commission shall, as soon as practicable after the expiration of the guaranty period, certify to the Secretary of the Treasury the amount of the railway operating income of the several carriers during such period, and the several amounts necessary to make good the guaranty to each. The Secretary of the Treasury is hereby authorized and directed thereupon to draw warrants in favor of each such carrier upon the Treasury of the United States, which shall be paid out of any moneys in the Treasury not otherwise appropriated, for the amount shown in such certificate as necessary to make good the guaranty.

(f) Upon appplication of any carrier to the Commission, asking that during the guaranty period there may be advanced to it from time to time such sums, not in excess of the estimated amount necessary to make good the guaranty, as are necessary to enable it to meet its fixed charges and operating expenses, the Commission may certify to the Secretary of the Treasury the amount of, and times at which, such advances, if any, shall be made. The Secretary of the Treasury, on receipt of such certificate, is authorized and directed to make the advances in the amounts and at the times specified in the certificate, upon the execution by the carrier of a contract, secured in such manner as the Secretary may determine, that upon final determination of the amount of the guaranty provided for by this section such carrier will repay to the United States any amounts which it has received from such advances in excess of the guaranty with interest at the rate of 6 per centum per annum from the time such excess was paid. If any such application is made before the carrier has filed with the Commission schedules embodying general increases in its rates, fares and charges, no advances shall be made under this paragraph unless such carrier enters into a contract, secured in such manner as the Secretary of the Treasury may determine, that if it fails to file such schedules within sixty days after the termination of Federal control it will repay to the United States the amount of such advances, with interest at the rate of 6 per centum per annum. No advances shall be made to any carrier after the expiration of sixty days after the termination of Federal control unless it has previously filed such schedules with the Commission.

(g) The contract of June 21, 1918, between the American Railway Express Company and the Director General of Railroads as amended and continued by agreement dated November 21, 1919, shall remain in full force and effect during the guaranty period so far as the same constitutes a guaranty on the part of the United States to the American Railway Express Company against an operating deficit: *Provided*, That such express company shall within sixty days after the termination of Federal control file with the Commission schedules embodying general increases in its rates, fares and charges.

The Commission shall, as soon as practicable after the expiration of the guaranty period, certify to the Secretary of the Treasury the amount of the operating deficit, if any, of the American Railway Express Company during such period and the amount necessary to make good such guaranty. The Secretary of the Treasury is hereby authorized and directed thereupon to draw warrants in favor of such express company upon the Treasury of the United States, which shall be paid out of any moneys in the Treasury not otherwise appropriated, for the amount shown in such certificate as necessary to make good the guaranty.

New Loans to Railroads

Sec. 208. (a) For the purpose of enabling carriers by railroad subject to the Commerce Act properly to serve the public during the transition period immediately following the termination of Federal control, any such carrier may, at any time after the passage of this Act and before the expiration of two years after the termination of Federal control, make application to the Commission for a loan from the United States, setting forth the amount of the loan and the term for which it is desired, the purpose of the loan and the uses to which it will be applied, the present and prospective ability of the applicant to repay the loan and meet the requirements of its obligations in that regard, the character and value of the security offered, and the extent to which the public convenience and necessity will be served. The application shall be accompanied by statements showing such facts and details as the Commission may require with respect to the physical situation, ownership, capitalization, indebtedness, contract obligations, operation and earning power of the applicant, together with such other facts relating to the propriety and expediency of granting the loan applied for and the ability of the applicant to make good the obligation, as the Commission may deem pertinent to the inquiry.

(b) If the Commission, after such hearing and investigation, with or without notice, as it may direct, finds that the making, in whole or in part, of the proposed loan by the United States is necessary to enable the applicant properly to meet the transportation needs of the people, and that the prospective earning power of the applicant and the character and value of the security offered are such as to furnish reasonable assurance of the applicant's ability to repay the loan within the time fixed therefor, the Commission may certify to the Secretary of the Treasury its findings of fact and its recommendations as to: the amount of the loan which is to be made; the time, not exceeding five years from the making thereof, within which it is to be repaid; the character of the security which is to be offered therefor; and the terms and conditions of the loan.

(c) Upon receipt of such certificate from the Commission, the Secretary of the Treasury, at any time before the expiration of 26 months after the termination of Federal control, is authorized to make a loan, not exceeding the maximum amount recommended in such certificate, out of any moneys in the revolving fund provided for in this section. All such loans shall bear interest at the rate of 6 per centum per annum, payable semi-annually to the Secretary of the Treasury, and to be placed to the credit of the revolving fund provided for in this section. The time, not exceeding five years from the making thereof, within which such loan is to be repaid, the security which is to be taken therefor, which shall be adequate to secure the loan, the terms and conditions of the loan, and the form of the obligation to be entered into, shall be prescribed by the Secretary of the Treasury.

(d) Loans so made shall be preferred liens upon the income and property of the applicant in the same manner and to the same extent that certificates issued by receivers appointed by United States courts are preferred liens upon the income and property that is being administered by the receiver.

(e) The Commission or the Secretary of the Treasury may call upon the Federal Reserve Board for advice and assistance with respect to any such application or loan.

(f) There is hereby appropriated out of any moneys in the Treasury not otherwise appropriated the sum of $250,000,000, which shall be used as a revolving fund for the purpose of making the loans provided for in this section.

Sec. 209. Any carrier securing a loan under the provisions of section 208, or funding under section 205 its indebtedness to the United States, shall not be subject, as regards the evidences of indebtedness given to the United States under either of such sections, to the provisions of section 20a of the Commerce Act added to such Act by section 437 of this Act.

Execution of Powers of President

Sec. 210. All powers and duties conferred or imposed upon the President by the preceding sections of this Act may be executed by him through such agency or agencies as he may determine.

Investigation of Needs of Water Transportation

Sec. 211. It shall be the duty of the Secretary of War, through the Chief of Engineers, with the object of promoting, encouraging, and developing inland waterway transportation facilities in connection with the commerce of the United States, to investigate the appropriate types of boats suitable for different classes of such waterways; to investigate the subject of water terminals, both for inland waterway traffic and for through traffic by water and rail, including the necessary docks, warehouses, apparatus, equipment, and appliances in connection therewith, and also railroad spurs and switches connecting with such terminals, with a view to devising the types most appropriate for different localities, and for the more expeditious and economical transfer or interchange of passengers or property between carriers by water and carriers by rail; to advise with communities, cities, and towns regarding the appropriate location of such terminals, and to cooperate with them in the preparation of plans for suitable terminal facilities; to investigate the existing status of water transportation upon the different inland waterways of the country, with a view to determining whether such waterways are being utilized to the extent of their capacity, and to what extent they are meeting the demands of traffic, and whether the water carriers utilizing such waterways are interchanging traffic with the railroads; and to investigate any other matter that may tend to promote and encourage inland water transportation. It shall also be the province and duty of the Chief of Engineers, under the direction of the Secretary of War, to compile, publish, and supply, from time to time, such useful statistics, data, and information concerning transportation on inland waterways as may be of value to the commercial interests of the country.

The words "inland waterways" used in this section shall be construed to include the Great Lakes.

Disputes Between Carriers and Their Employees

Sec. 300. That it shall be the duty of all carriers subject to this Act and their agents, officers, and employees to exert every reasonable effort and adopt every available and reasonable means to avoid interruption to the operation of a carrier subject to this Act growing out of controversy or dispute over any question of wages, working conditions, or discipline of employees.

Questions affecting wages, working conditions, or discipline or employees on a carrier's line shall be considered, and, if possible, adjusted in conference between representatives of the class or classes of employees affected, or to be affected thereby, and representatives of the carrier or carriers designated or authorized by it to so act. If any such question can not be adjusted in such conferences it shall be referred to the appropriate board of adjustment, hereinafter provided for. If such question can not be decided or adjusted by such board it shall be referred to the Commission on Labor Disputes, herinafter provided for.

Boards are hereby created and established to be known as Railway Board of Adjustment Number One, Railway Board of Adjustment Number Two, and Railway Board of Adjustment Number Three, for the purpose of handling and adjusting disputes that have not otherwise been disposed of, affecting the question of wages, working conditions, discipline, and personal grievances of employees of carriers subject to this Act.

Railway Board of Adjustment Number One, represented by the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, the Order of Railway Conductors, and the Brotherhood of Railroad Trainmen.

Railway Board of Adjustment Number Two, represented by the International Association of Machinists; the International Brotherhood of Boiler Makers, Iron-Ship Builders and Helpers of America; the International Brotherhood of Blacksmiths and Helpers; the Brotherhood of Railway Carmen of America; the Amalgamated Sheet Metal Workers' Alliance, and the International Brotherhood of Electrical Workers.

Railway Board of Adjustment Number Three, represented by the Order of Railway Telegraphers, Switchmen's Union of North America, Brotherhood of Railway Clerks, and the United Brotherhood of Maintenance of Way Employees and Railroad Shop Laborers.

All controversies growing out of questions of wages, the interpretation or application of the provisions of wage schedules, or agreements which are not promptly adjusted by the officials, and the employees on any of the carrier lines subject to the provisions of this Act shall be disposed of in the following manner:

There shall be created within thirty days after the passage of this Act a board to be known as Railway Board of Adjustment Number One, to consist of eight members, four to be selected and compensated by the carriers subject to the provisions of this Act, and one each by the chief executive officer of each of the four organizations of employees hereinbefore named, and to be compensated by such organization.

There shall be created within thirty days after the passage of this Act a board to be known as Railway Board of Adjustment Number Two, to consist of twelve members, six to be selected and compensated by the carriers subject to the provisions of this Act, and one each by the chief executive officer of each of the six organizations of employees hereinbefore named, and to be compensated by such organization.

There shall be created within thirty days after the passage of this Act a board to be known as Railway Board of Adjustment Number Three, to consist of eight members, four to be selected and compensated by the carriers subject to the provisions of this Act, and one each by the chief executive officer of each of the four organizations of employees hereinbefore named, and to be compensated by such organization.

The aforesaid Railway Boards of Adjustment shall meet in the city of Washington within ten days after the selection of their members, and each elect a chairman and vice chairman, who shall be members of the board, and each chairman or vice chairman shall preside at all meetings of their respective boards, and shall be required to vote upon the adoption of all decisions of the board of which they are members.

The boards shall meet regularly at stated times each month and continue in session until all matters before them are considered.

Unless otherwise mutually agreed, all meetings of the boards shall be held in the city of Washington: *Provided,* That each board shall have authority to empower two or more of its members to conduct hearings and pass upon controversies, when properly submitted, at any place designated by the board: *Provided further,* That such subdivision of the board will not be authorized to make final decision. All decisions shall be made and approved by the entire board as hereinbefore provided.

Should a vacancy occur in any board for any cause, such vacancy shall be immediately filled by the same appointive authority which made the original selection.

All authority invested in the committee commonly known as the Commission of Eight to adjust disputes arising out of the application of the so-called eight-hour law is hereby transferred to Railway Board of Adjustment Number One, in the same manner as has heretofore been done by the Commission of Eight. All decisions of a general character heretofore made by the so-called Commission of Eight or by the United States Railroad Administration, affecting the questions of wages, hours of service or conditions of employment, are hereby confirmed and shall apply to all carriers subject to this Act, unless exempted in such eight-hour law. Decisions which have been rendered by the so-called Commission of Eight or the United States Railroad Administration, and which apply to individual carriers subject to the provisions of this Act, shall remain in effect until superseded by mutual agreement between the carrier and the employees, or by the decision of Railway Board of Adjustment Number One, or the Commission on Labor Disputes made in accordance with the provisions of this Act.

All decisions of a general character heretofore made by the United States Railroad Administration affecting the questions of wages, hours of service, or conditions of employment, are hereby confirmed and shall apply to all carrier lines subject to this Act. Decisions which have been rendered by the United States Railroad Administration, and which apply to the individual carriers subject to the provisions of this Act, shall remain in effect until superseded by mutual agreement between the carrier and the employees or by decision of Railway Board of Adjustment Number Two, or Railway Board of Adjustment Number Three, or the proper Commission on Labor Disputes made in accordance with the provisions of this Act.

The respective railway boards of adjustment shall render decisions on all matters in dispute and as provided herein and when properly submitted to the boards.

Questions of wages, hours of service, and conditions of employment, including controversies arising from interpretation of wage agreements, shall be decided by the railway boards of adjustment, when properly presented to them.

Wages, hours of service and conditions of employment, when fixed by the boards or commissions on labor disputes, shall be incorporated in existing agreements on the several carrier lines subject to the provisions of this Act, and should differences arise between the officials and the employees of any of the carriers subject to this Act, as to such incorporation, intent, or application, such questions of difference shall be decided by the respective railway boards of adjustment when properly presented.

Personal grievances or controversies arising under interpretation of wage agreements and all other disputes arising between officials of any carrier subject to this Act and its employees will be handled in their usual manner by general committees of their employees up to and including the chief operating officer of the carrier (or some one officially designated by him), when, if an agreement is not reached, the chairman of the general committee of employees may refer the matter to the chief executive officer of the organization concerned; and if the contention of the employees' committee is approved by such executive officer of the organization, then the chief operating officials of the carrier and the chief executive officer of the organization concerned shall refer the matter, with all supporting papers, to the proper Railway Board of Adjustment, which board shall promptly hear and decide the case, giving due notice to the chief operating officer of the carrier interested and the chief executive officer of the organization concerned of the time set for hearing.

No matter will be considered by the respective Railway Boards of Adjustment unless officially referred to them in the manner herein prescribed.

In hearings before the respective Railway Boards of Adjustment, in matters properly submitted for their consideration, the carrier shall be represented by such person or persons as may be designated by the chief operating officer, and the employees shall be presented by such person or persons as may be designated by the chief executative officer of the organization concerned.

All clerical and office expenses shall be paid by the United States Government. The carrier directly concerned and the organization involved in the hearing will, respectively, assume any expense incurred in presenting a case.

In each case an effort should be made to present a joint concrete statement of facts as to any controversy, but the respective boards are fully authorized to require information in addition to the concrete statement of facts, and may call upon the chief operating officer of the carrier or the chief executive officer of the organization concerned for additional evidence, either oral or written.

All decisions of the respective Railway Boards of Adjustment shall be approved by a majority vote of all members of such board.

After a matter has been considered by a board and in the event a majority vote can not be obtained, then any four members of Railway Board of Adjustment Number One, or any six members of Railway Board of Adjustment Number Two, or any four members of Railway Board of Adjustment Number Three, depending upon the board considering the matter, may elect to refer the matter upon which no decision has been reached to the proper Commission on Labor Disputes for a final decision.

Each Railway Board of Adjustment shall keep a complete and accurate record of all matters submitted for its consideration and of all decisions made by the board.

Each Railway Board of Adjustment shall file a report of all cases decided, including the decision, with the Interstate Commerce Commission,

with the chief operating officer of the carrier affected, and with the chief executive officers of the organizations concerned.

Sec. 301. Within thirty days from the passage of this Act there shall be created and established three commissions, which shall be known and designated as Commission on Labor Disputes Number One, Commission on Labor Disputes Number Two, and Commission on Labor Disputes Number Three, in the following manner:

Commission on Labor Disputes Number One shall consist of eight members, four of whom shall be selected by the carriers subject to the provisions of this Act, and four who shall be the chief executive officers of the organizations of employees, or some person designated by them, hereinbefore mentioned in connection with the creation of Railway Board of Adjustment Number One.

Commission on Labor Disputes Number Two shall consist of twelve members, six of whom shall be selected by the carriers subject to the provisions of this Act, and six who shall be the chief executive officers of the organizations of employees, or some person designated by them, hereinbefore mentioned in connection with the creation of Railway Board of Adjustment Number Two.

Commission on Labor Disputes Number Three shall consist of eight members, four of whom shall be selected by the carrier subject to the provisions of this Act, and four who shall be the chief executive officers of the organizations of employees, or some person designated by them, hereinbefore mentioned in connection with the creation of Railway Board of Adjustment Number Three.

It shall be unlawful for any member of a Railway Board of Adjustment or any member of a Commission on Labor Disputes to be a member at the same time of any other board of commission herein provided for; nor shall he act as a member of any Commission on Labor Disputes in any case in which he took part during its presentation and consideration before any Railway Board of Adjustment herein provided for.

Any controversy growing out of questions of wages, interpretation or application of the provisions of wage schedules or agreements, discipline, or personal grievances of the employees, arising on any carrier line subject to this Act, on which no agreement has been reached by Railway Board of Adjustment Number One, or Railway Board of Adjustment Number Two, or Railway Board of Adjustment Number Three, may be referred to the Commission on Labor Disputes Number One, or Commission on Labor Disputes Number Two, or Commission on Labor Disputes Number Three, respectively, for final action.

The Commission on Labor Disputes shall meet in the city of Washington within ten days after the selection of their members and elect a chairman and vice chairman, who shall be members of the commission. The chairman or vice chairman will preside at all meetings of the commission, and both shall be required to vote upon the adoption of all decisions of the commission.

The commissions shall meet at such time as is deemed necessary and continue in session until matters referred to them are diposed of.

Unless otherwise mutually agreed, all meetings of the commissions shall be held in the city of Washington: *Provided,* That the commissions shall have authority to conduct hearings and pass upon controversies, when properly submitted, at any place designated by the commissions.

Should a vacancy occur in either of the commissions from any cause, such vacancy shall immediately be filled by the same appointive authority which made the original selection.

A Commission on Labor Disputes shall render decisions on all matters in dispute as provided herein when properly submitted to such commission.

No matter will be considered by a commission on Labor Disputes unless officially referred to it in the manner herein prescribed.

In hearings before a commission, in matters properly submitted for its consideration, the carrier shall be represented by such person or persons as may be designated by the chief operating officer, and the employee shall be represented by such person or persons as may be designated by the chief executive officer of the organization concerned.

The clerical and office expenses of the commissions will be paid by the United States Government. The carrier directly concerned and the organization involved in the hearing will, respectively, assume any expenses incurred in presenting a case.

Each commission on labor disputes shall keep a complete and correct record of all matters submitted for its consideration and all decisions made by the commission.

A commission will have authority to hear and decide only such cases as are properly referred to it by the railway boards of adjustment. All decisions of a commission on labor disputes shall be approved by a majority vote of all members of the commission.

A report of all cases decided, including the decisions, shall be filed with the Interstate Commerce Commission, with the chief officer of the carrier affected, and with the chief executive officers of the organizations concerned.

Additional boards of adjustment and commissions on labor disputes may be organized from time to time to cover other employees or classes of employees under the provisions of this Act.

For the purpose of making this section effective the members of railway boards of adjustment or commissions on labor disputes, or either of them, shall have the power to administer oaths and affirmations, sign subpœnas, require the attendance and testimony of witnesses and the production of books, papers, contracts, agreements, and documents material to a just determination of any matter under investigation, and may invoke the aid of the United States courts to compel witnesses to attend and testify and to produce such books, papers, contracts, agreements, and documents to the same extent and under the same conditions and penalties as are provided for in the Act to regulate commerce.

Testimony before railway boards of adjustment or commissions on labor disputes shall be given under oath or affirmation when it is deemed necessary by such boards or commissions. Any railway board of adjustment or commission on labor disputes may employ such assistants as may be necessary in carrying on this work. Any railway board of adjustment or commission on labor disputes shall whenever practicable be supplied with suitable quarters in any Federal building located at its place of meeting or at any place to which it may adjourn for its deliberations.

The United States Railroad Administration and the Board of Mediation and Conciliation are hereby authorized to turn over to railway boards of adjustment or to the commissions on labor disputes upon request any properties or documents heretofore filed with them and bearing upon mediation, arbitration, or other adjustments or proceedings held under the provisions of the Act approved June 1, 1898, or the Act approved July 15, 1913, providing for mediation and arbitration, or decisions rendered by the United States Railroad Administration.

The sum of $50,000, or so much thereof as may be necessary, is hereby authorized to be immediately available and continue available until the close of the fiscal year ending June 30, 1920, for the necessary and proper expenses incurred in connection with carrying on the work of railway boards of adjustment and commissions on labor disputes, including rent in the District of Columbia, furniture, office fixtures and supplies, assistants, clerical work, and other necessary expenses to be approved by the chairmen of the railway boards of adjustment and commissions on labor disputes and audited by the proper accounting officer of the Treasury.

Any person, corporation, organization, or association violating any of the provisions of sections 300 and 301 of this Act shall be deemed guilty of a misdemeanor, and for each offense, on conviction, shall pay to the United States a penalty of $500.

Sec. 400. The first five paragraphs of section 1 of the Commerce Act, as such paragraphs appear in section 7 of the Commerce Court Act, are hereby amended to read as follows:

"(1) That the provisions of this Act shall apply to common carriers engaged in—

"(a) The transportation of passengers or property wholly by railroad, or partly by railroad and partly by water when both are used under a common control, management, or arrangement for a continuous carriage or shipment; or

"(b) The transportation of oil or other commodity, except water and except artificial gas, by pipe line, or partly by pipe line and partly by railroad or by water; or

"(c) The transmission of intelligence by wire or wireless;—

from one State or Territory of the United States, or the District of Columbia, to any other State or Territory of the United States, or the District of Columbia, or from one place in a Territory to another place in the same Territory, or from any place in the United States through a foreign country to any other place in the United States, or from or to any place in the United States to or from a foreign country.

"(2) The provisions of this Act shall also apply to such transportation of passengers and property and transmission of intelligence, in so far as such transportation or transmission takes place within the United States, but shall not apply—

"(a) To the transportation of passengers or property, or to the receiving, delivering, storage, or handling of property, wholly within one State and not shipped to or from a foreign country from or to any place in the United States as aforesaid; nor

"(b) To the transmission of intelligence by wire or wireless wholly within one State and not transmitted to or from a foreign country from or to any place in the United States as aforesaid.

"(3) The term 'common carrier' as used in this Act shall include all pipe-line companies; telegraph, telephone, and cable companies operating by wire or wireless; express companies; sleeping-car companies; and all persons, natural or artificial, engaged in such transportation or transmission as aforesaid as common carriers for hire. Wherever the word 'carrier' is used in this Act it shall be held to mean 'common carrier.' The term 'railroad' as used in this Act shall include all bridges, car floats, lighters, and ferries used by or operated in connection with any railroad, and also all the road in use by any common carrier operating a railroad, whether owned or operated under a contract, agreement, or lease, and also all switches, spurs, tracks, terminals, and terminal facilities of every kind used or necessary in the transportation of the persons or property designated herein, including all freight depots, yards, and grounds, used or necessary in the transportation or delivery of any such property. The term 'transportation' as used in this Act shall include locomotives, cars, and other vehicle, vessels and all instrumentalities and facilities of shipment or carriage, irrespective of ownership or of any contract, express or implied, for the use there, and all services in connection with the receipt, delivery, elevation, and transfer in transit, ventilation, refrigeration or icing, storage, and handling of property transported. The term 'transmission' as used in this Act shall include the transmission of intelligence through the application of electrical energy or other use of electricity, whether by means of wire, cable, radio apparatus, or other wire or wireless conductors or appliances, and all instrumentalities and facilities for and services in connection with the receipt, forwarding, and delivery of messages, communications, or other intelligence so transmitted, hereinafter also collectively called messages.

"(4) It shall be the duty of every common carrier subject to this Act engaged in the transportation of passengers or property to provide and furnish such transportation upon reasonable request therefor, and to establish through routes and just and reasonable rates, fares, and charges applicable thereto, and to provide reasonable facilities for operating through routes and to make reasonable rules and regulations with respect to the operation of through routes, and providing for reasonable compensation to those entitled thereto; and in case of joint fares, fares, or charges, to establish just and reasonable divisions thereof as between the carriers subject to this Act participating therein which shall not unduly prefer or prejudice any of such participating carriers.

"(5) All charges made for any service rendered or to be rendered in the transportation of passengers or property or in the transmission of intelligence by wire or wireless as aforesaid, or in connection therewith, shall be just and reasonable, and every unjust and unreasonable charge for such service or any part thereof is prohibited and declared to be unlawful: *Provided,* That messages by wire or wireless subject to the provisions of this Act may be classified into day, night, repeated, unrepeated, letter, commercial, press, Government, and such other classes as are just and reasonable, and different rates may be charged for the different classes of messages: *And provided further,* That nothing in this Act shall be construed to prevent telephone, telegraph, and cable companies from entering into contracts with common carriers for the exchange of services.

"(6) It is hereby made the duty of all common carriers subject to the provisions of this Act to establish, observe, and enforce just and reason-

able classifications of property for transportation, with reference to which rates, tariffs, regulations or practices are or may be made or prescribed, and just and reasonable regulations and practices affecting classifications, rates, or tariffs, the issuance, form, and substance of tickets, receipts, and bills of lading, the manner and method of presenting, marking, packing, and delivering property for transportation, the facilities for transportation, the carrying of personal, sample, and excess baggage, and all other matters relating to or connected with the receiving, handling, transporting, storing, and delivery of property subject to the provisions of this Act which may be necessary or proper to secure the safe and prompt receipt, handling, transportation, and delivery of property subject to the provisions of this Act upon just and reasonable terms, and every unjust and unreasonable classification, regulation, and practice is prohibited and declared to be unlawful.

"(7) No common carrier subject to the provisions of this Act shall, after January 1, 1920, directly or indirectly, issue or give any interstate free ticket, free pass, or free transportation for passengers, except to its officers, agents, and employees, and their families; to its surgeons, physicians, and attorneys at law, who devote the principal part of their time to its service; to ministers of religion, traveling secretaries of railroad Young Men's Christian Associations, inmates of hospitals and charitable and eleemosynary institutions, and persons exclusively engaged in charitable and eleemosynary work; to indigent, destitute, and homeless persons, and to such persons when transported by charitable societies or hospitals, and the necessary agents employed in such transportation; to inmates of the National Homes or State Homes for Disabled Volunteer Soldiers, and of Soldiers' and Sailors' Homes, including those about to enter and those returning home after discharge; to necessary caretakers of live stock, poultry, fish, milk, and fruit, transported by it; to employees on sleeping cars or express cars, moving over its line; to Railway Mail Service employees, post-office inspectors, custom inspectors, and immigration inspectors, traveling in the discharge of their duties; to newsboys on its trains; to baggage transfer agents on duty; to witnesses attending any legal investigation in which it is interested; or to persons injured in wrecks, and physicians, surgeons, and nurses attending such persons, or to the remains of persons killed in wrecks; nor after such date shall any such carrier directly or indirectly give or issue any free frank for or free transmission of intelligence, except to its officers, agents and employees, and their families; or to its surgeons, physicians, and attorneys at law, who devote the principal part of their time to its service: *Provided,* That this provision shall not be construed to prohibit the interchange of passes or franks for the officers, agents, and employees of common carriers, and their families; nor to prohibit any common carrier from carrying passengers free with the object of providing relief in cases of wreck, general epidemic, pestilence, or other calamitous visitation: *Provided, however,* That no such free pass or free transportation shall be given to or asked or received or used by any such person if he be a Member of the Congress of the United States or an officer of the United States who under existing laws is now prohibited from accepting or using free passes or free transportation: *And provided further,* That the term "employee" as used in the paragraph shall include furloughed, pensioned, and superannuated employees, persons who have became disabled or infirm in the service of any such common carrier, and the remains of a person killed in the employment of a carrier, and ex-employees traveling for the purpose of entering the service of any such common carrier; and the term "families" as used in this paragraph shall include the families of those persons named in this proviso, also the families of persons killed, and the widows during widowhood, and minor children during minority of persons who died, while in the service of any such common carrier. Any common carrier violating the provisions of this paragraph shall be deemed guilty of a misdeameanor, and for each offense, on conviction, shall pay to the United States a penalty of not less than $100 nor more than $2,000; and any person, other than the person excepted in this paragraph, who uses any such interstate free ticket, free pass, free frank, or free transportation shall be subject to a like penalty. Jurisdiction of offenses under this paragraph shall be the same as that provided for offenses in an Act entitled 'An Act to further regulate commerce with foreign nations and among the States,' approved February 19, 1903, and any amendment thereof."

SEC. 402. The paragraphs added to section 1 of the Commerce Act by the Act entitled "An Act to amend an Act entitled 'An Act to regulate commerce,' as amended, in respect of car service, and for other purposes," approved May 29, 1917, are hereby amended to read as follows:

"(10) The term 'car service' in this Act shall include the use, control, supply, movement, distribution, exchange, interchange, and return of locomotives, cars, and other vehicles used in the transportation of property, and the supply, movement, and operation of trains, by any carrier by railroad subject to this Act.

"(11) It shall be the duty of every carrier by railroad subject to this Act to furnish safe and adequate car service and to establish, observe, and enforce just and reasonable rules, regulations, and practices with respect to car service; and every unjust and unreasonable rule, regulation, and practice with respect to car service is prohibited and declared to be unlawful.

"(12) It shall also be the duty of every carrier by railroad to make just and reasonable distribution of cars for transportation of coal among the coal mines served by it, whether located upon its line or lines or customarily dependent upon it for car supply. During any period when the supply of cars aavilable for such service does not equal the requirements of such mines it shall be the duty of the carrier to maintain and apply just and reasonable ratings of such mines and to count each and every car furnished to or used by any such mine for transportation of coal against the mine. Failure or refusal so to do shall be unlawful, and in respect of each car not so counted shall be deemed a separate offense, and the carrier, receiver, or operating trustee so failing or refusing shall forfeit to the United States the sum of $100 for each offense, which may be recovered in a civil action brought by the United States.

"(13) The Commission is hereby authorized by general or special orders to require all carriers by railroad subject to this Act, or any of them, to file with it from time to time their rules and regulations with respect to car service, and the Commission may, in its discretion, direct that such rules and regulations shall be incorporated in their schedules showing rates, fares, and charges for transportation, and be subject to any or all of the provisions of this Act relating thereto.

"(14) The Commission may, after hearing, on a complaint or upon its own initiative without complaint, establish reasonable rules, regulations, and practices with respect to car service by carriers by railroad subject to this Act, including the compensation to be paid for the use of any locomotive, car, or other vehicles not owned by the carrier using it, and the penalties or other sanctions for nonobservance of such rules, regulations or practices.

"(15) Whenever the Commission is of opinion that shortage of equipment, congestion of traffic, or other emergency requiring immediate action exists in any section of the country, the Commission shall have, and it is hereby given, authority, either upon complaint or upon its own initiative without complaint, at once, if it so orders, without answer or other formal pleading by the interested carrier or carriers, and with or without notice, hearing, or the making or filing of a report, according as the Commission may determine: (a) to suspend the operation of any or all rules, regulations, or practices then established with respect to car service for such time as may be determined by the Commission; (b) to make such just and reasonable directions with respect to car service without regard to the ownership as between carriers of locomotives, cars, and other vehicles, and to handling, routing, and movement of traffic, during such emergency as in its opinion will best promote the service in the interest of the public and the commerce of the people, upon such terms of compensation as between the carriers for the use of facilities and for handling, routing, or movement of traffic as they may agree upon, or, in the event of their disagreement, as the Commission may after subsequent hearing find to be just and reasonable; (c) to require such joint or common use of terminals as in its opinion will best meet the emergency and serve the public interest, and upon such terms as between the carriers as they may agree upon, or, in the event of their disagreement, as the Commission may after subsequent hearing find to be just and reasonable; and (d) to give directions for preference or priority in transportation, embargoes, or movement of traffic under permits, at such time and for such periods as it may determine, and to modify, change, suspend, or annul them. In time of war or threatened war the President may certify to the Commission that it is essential to the national defense and security that certain traffic shall have preference or priority in transportation, and the Commission shall, under the power herein conferred, direct that such preference or priority be afforded.

"(16) The directions of the Commission as to car service and to the matters referred to in paragraph (15) may be made through and by such agents or agencies as the Commission shall designate and appoint for that purpose. It shall be the duty of all carriers by railroad subject to this Act, and of their officers, agents, and employees, to obey strictly and conform promptly to such orders of directions of the Commission, and in case of failure or refusal on the part of any carrier, receiver, or operating trustee to comply with any such order or direction such carrier, receiver, or trustee shall be liable to a penalty of not less than $100 nor more than $500 for each such offense and $50 for each and every day of the continuance of such offense, which shall accrue to the United States and may be recovered in a civil action brought by the United States: *Provided, however,* That nothing in this Act shall impair or affect the right of the State, in the exercise of its police power, to require just and reasonable freight and passenger service and the fair exchange and distribution of equipment for intrastate business.

"(17) After ninety days after this paragraph takes effect no carrier by railroad subject to this Act shall undertake the extension of its line of railroad, or the construction of a new line of railroad, or shall require or operate any line of railroad, or extension thereof, or shall engage in transportation under this Act over or by means of such additional or extended line of railroad, unless and until there shall first have been obtained from the Commission a certificate that the present or future public convenience and necessity require or will require the construction, or operation, or construction and operation, of such additional or extended line of railroad, and no carrier by railroad subject to this Act shall abandon all or any portion of a line of railroad, or the operation thereof, unless and until there shall first have been obtained from the Commission a certificate that the present or future public convenience and necessity permit of such abandonment.

"(18) The application for and issuance of any such certificate shall be under such rules and regulations as to hearings and other matters as the Commission may from time to time prescribe, and the provisions of this Act shall apply to all such proceedings. Upon receipt of any application for such certificate the Commission shall cause notice thereof to be given to and a copy filed with the railroad commission, or public service or utilities commission, or other appropriate authority, or the governor, of each State in which such additional or extended line of railroad is proposed to be constructed or operated, or all or any portion of a line of railroad, or the operation thereof, is proposed to be abandoned, with the right to be heard as hereinafter provided with respect to the hearing of complaints or the issuance of securities; and said notice shall also be published for three consecutive weeks in some newspaper of general circulation in each county in or through which said line of railroad is constructed or operates.

"(19) The Commission shall have power to issue such certificate as prayed for, or to refuse to issue it, or to issue it for a portion or portions of a line of railroad, or extension thereof, described in the application, or for the partial exercise only of such right or privilege, and may attach to the issuance of the certificate such terms and conditions as in its judgment the public convenience and necessity may require. From and after issuance of such certificate, and not before, the carrier by railroad may, without securing approval other than such certificate, comply with the terms and conditions contained in or attached to the issuance of such certificate and proceed with the construction, operation, or abandonment covered thereby. Any construction, operation, or abandonment contrary to the provisions of paragraph (17), (18) or (19) of this section may be enjoined by any court of competent jurisdiction at the suit of the United States, the Commission, any commission or regulating body of the State or States affected, or any party in interest, and any carrier knowingly violating any of the foregoing provisions shall be guilty of a misdemeanor and upon conviction shall be liable to the penalties provided for violation of this Act.

"(20) The Commission may, after hearing, in a proceeding upon complaint or upon its own initiative without complaint, authorize or require

by order any carrier by railroad subject to this Act, party to such proceeding, to provide itself with safe and adequate facilities for performing as a common carrier its car service as that term is used in this Act, and to extend its line or lines: *Provided*, That the Commission shall find that such provision of facilities or extension is reasonably required in the interest of public convenience and necessity and will not impair the ability of the carrier to perform its duty to the public. Any carrier subject to this Act which refuses or neglects to comply with any order of the Commission made in pursuance of this paragraph shall be liable to a penalty of $100 for each day during which such refusal or neglect continues, which shall accrue to the United States and may be recovered in a civil action brought by the United States.

"(21) The authority of the Commission conferred by paragraphs (17) to (20), both inclusive, shall not extend to the construction or abandonment of any line located or to be located wholly within one State or to any street car or electric interurban line."

Sec. 405. The first paragraph of section 3 of the Commerce Act is hereby amended by inserting "(1)" after the section number at the beginning thereof.

The second paragraph of section 3 of the Commerce Act is hereby amended to read as follows:

"(2) All carriers, engaged in the transportation of passengers or property, subject to the provisions of this Act, shall, according to their respective powers, afford all reasonable, proper, and equal facilities for the interchange of traffic between their respective lines, and for the receiving, forwarding, and delivering of passengers or property to and from their several lines and those connecting therewith, and shall not discriminate in their rates, fares, and charges between such connecting lines. The Commission may require the terminals of any such carrier to be open to the traffic of other such carriers upon such just and reasonable terms and conditions, including just compensation to the owners thereof, as the Commission after notice and full hearing, upon complaint or upon its own initiative, may by order prescribe."

Sec. 407. The first paragraph of section 5 of the Commerce Act is hereby amended to read as follows:

"Sec. 5. (1) That, except upon specific approval by order of the Commission as in this section provided, and except as provided in paragraph (15) of section 1 of this Act, it shall be unlawful for any common carrier subject to this Act to enter into any contract, agreement, or combination with any other common carrier or carriers for the pooling of freights of different and competing railroads, or to divide between them the aggregate or net proceeds of the earnings of such railroads, or any portion thereof; and in any case of an agreement for the pooling of freights as aforesaid each day of its continuance shall be deemed a separate offense: *Provided*, That whenever the Commission is of opinion, after hearing upon application of any carriers or carriers, engaged in the transportation of passengers or property, subject to this Act, or upon its own initiative, that the unification, consolidation, or merger by purchase, lease, stock control, or in any other way, similar or dissimilar, of two or more such carriers subject to this Act, or of the ownership or operation of their properties, or of designated portions thereof, or that the pooling of their traffic, earnings or facilities, to the extent indicated by the Commission, will be in the interest of better service to the public, or economy in operation, or otherwise of advantage to the convenience and commerce of the people, the Commission shall have authority by order to approve and authorize such unification, consolidation, merger, or pooling, under such rules and regulations, and for such consideration as between such carriers and upon such terms and conditions, as shall be found by the Commission to be just and reasonable in the premises The power and authority of the Commission to approve and authorize the unification, consolidation or merger of two or more carriers shall extend and apply to the unification, consolidation or merger of four express companies into the American Railway Express Company, a Delaware corporation, if application for such approval and authority is made to the Commission within thirty days after the passage of this amendatory Act; and pending the decision of the Commission such unification, consolidation or merger, shall not be dissolved.

"(2) The Commission may from time to time, for good cause shown, make such supplemental orders in the premises as it may deem necessary or appropriate, and may by any such supplemental order modify or set aside the provisions of any previous order as to the extent of the pooling, or as to the rules, regulations, terms, conditions, or consideration currently moving in respect of any unification or consolidation of operation and not of ownership, or of pooling, so theretofore approved and authorized.

"(3) The carriers affected by any such order shall be and they are hereby relieved from the operation of the 'anti-trust laws,' as designated in section 1 of the Act approved October 15, 1914, entitled 'An Act to supplement existing laws against unlawful restraints and monopolies, and for other purposes,' and of all other restraints or prohibitions by law, in so far as may be necessary to enable them to effect any unification, consolidation, merger or pooling so approved by order under and pursuant to the foregoing provisions of this section."

Sec. 408. The paragraph of section 5 of the Commerce Act, added to such section by section 11 of the Act entitled "An Act to provide for the opening, maintenance, protection and operation of the Panama Canal and the sanitation and government of the Canal Zone," approved August 24, 1912, is hereby amended by inserting "(4)" at the beginning thereof.

The two paragraphs of section 11 of such Act of August 24, 1912, which follow the paragraph added by such section to section 5 of the Commerce Act, are hereby made a part of section 5 of the Commerce Act. The first paragraph so made a part of section 5 of the Commerce Act is hereby amended by inserting "(5)" at the beginning thereof, and the second such paragraph is hereby amended to read as follows:

"(6) If the Commission is of the opinion that any such existing or proposed new specified service by water, other than through the Panama Canal, is being or will be operated in the interest of the public, and is or will be of advantage to the convenience and commerce of the people, and that a discontinuance of the existing service, or a failure to establish the proposed new service, will be substantially injurious to the commerce or localities affected, the Commission may, upon such just and reasonable terms as it may prescribe, by order extend the time during which such existing service by water may continue to be operated, or authorize the establishment and maintenance of the proposed new service, until its further order after hearing: *Provided*, That no new service shall be authorized except in or upon the Great Lakes and their connecting waterways, or on a navigable water (other than through the Panama Canal) where the major portion of the service is upon the high seas or upon Long Island Sound. In every case of such extension or authorization the rates, schedules and practices of such water carrier shall be filed with the Commission and shall be subject to this Act and all amendments thereto in the same manner and to the same extent as is the railroad or other common carrier controlling such water carrier or interested in any manner in its operation."

Sec. 415. Section 13 of the Commerce Act is hereby amended by inserting "(1)" after the section number at the beginning of the first paragraph and "(2)" at the beginning of the second paragraph, and by adding at the end thereof two new paragraphs to read as follows:

"(3) Whenever in any investigation under the provisions of this Act, or in any investigation instituted upon petition of the carrier concerned, which petition is hereby authorized to be filed, there shall be brought in issue any rate, fare, charge, classification, regulation or practice made or imposed by authority of any State, the Commission, before proceeding to hear and dispose of such issue, shall cause such State or States to be notified of the proceeding. The Commission may confer with the authorities of any State having regulatory jurisdiction over the class of persons and corporations subject to this Act with respect to the relationship between rate structures and practices of carriers subject to the jurisdiction of such State bodies and of the Commission; and to that end is authorized and empowered, under rules to be prescribed by it, and which may be modified from time to time, to hold joint hearings with any such State regulating bodies on any matters wherein the Commission is empowered to act and where the rate-making authority of a State is or may be affected by the action taken by the Commission. The Commission is also authorized to avail itself of the co-operation, services, records and facilities of such State authorities in the enforcement of any provision of this Act.

"(4) The Commission shall have authority, after full hearing, to make such findings and orders as may in its judgment tend to remove any undue advantage, preference or prejudice as between persons or localities in intrastate commerce on the one hand and interstate or foreign commerce on the other hand, or any undue burden upon interstate or foreign commerce, which is hereby forbidden and declared to be unlawful, and such findings or orders shall be observed while in effect by the carriers parties to such proceeding affected thereby, the law of any State or the decision or order of any State authority to the contrary notwithstanding."

Sec. 417. The first four paragraphs of section 15 of the Commerce Act are hereby amended to read as follows:

"Sec. 15. (1) That whenever, after full hearing, upon a complaint made as provided in section 13 of this Act, or after full hearing under an order for investigation and hearing made by the Commission on its own initiative, either in extension of any pending complaint or without any complaint whatever, the Commission shall be of opinion that any individual or joint rate, fare or charge whatsoever demanded, charged or collected by any common carrier or carriers subject to this Act for the transportation of persons or property or for the transmission of messages as defined in the first section of this Act, or that any individual or joint classification, regulation or practice whatsoever of such carrier or carriers subject to the provisions of this Act, is or will be unjust or unreasonable or unjustly discriminatory or unduly prefcrential or prejudicial, or otherwise in violation of any of the provisions of this Act, the Commission is hereby authorized and empowered to determine and prescribe what will be the just and reasonable individual or joint rate, fare or charge, or rates, fares or charges, to be thereafter observed in such case, or the maximum, or minimum, or maximum and minimum, to be charged, and what individual or joint classification, regulation, or practice is or will be just, fair and reasonable, to be thereafter followed, and to make an order that the carrier or carriers shall cease and desist from such violation to the extent to which the Commission finds that the same does or will exist, and shall not thereafter publish, demand or collect any rate, fare or charge for such transportation or transmission other than the rate, fare or charge so prescribed, or in excess of the maximum or less than the minimum so prescribed, as the case may be, and shall adopt the classification and shall conform to and observe the regulation or practice so prescribed.

"(2) Except as otherwise provided in this Act, all orders of the Commission, other than orders for the payment of money, shall take effect within such reasonable time, not less than thirty days, and shall continue in force until its further order, or for a specified period of time, according as shall be prescribed in the order, unless the same shall be suspended or modified or set aside by the Commission, or be suspended or set aside by a court of competent jurisdiction.

"(3) Whenever, after full hearing upon complaint or upon its own initiative, the Commission is of opinion that the divisions of joint rates, fares or charges, applicable to the transportation of passengers or property, are or will be unjust, unreasonable or unduly preferential or prejudicial as between the carriers parties thereto (whether agreed upon by such carriers, or any of them, or otherwise established), the Commission shall by order prescribe the just and reasonable divisions thereof to be received by the several carriers, and in cases where the joint rate, fare or charge was established pursuant to a finding or order of the Commission and the divisions thereof are found by it to have been unjust, unreasonable, or unduly preferential or prejudicial, the Commission may also by order determine what (for the period subsequent to the filing of the complaint or petition or the making of the order of investigation) would have been the just and reasonable divisions thereof to be received by the several carriers, and require adjustment to be made in accordance therewith. The Commission may also, after full hearing upon complaint or upon its own initiative, establish through routes, joint classification, and joint rates, fares or charges, applicable to the transportation of passengers or property, or the maxima, or minima, or maxima and minima, to be charged, and the divisions of such rates, fares or charges as hereinbefore provided, and the terms and conditions under which such through routes shall be operated; and this provision shall apply when one of the carriers is a water line. The Commission shall not, however, establish any through route, classifica-

tion or rate between street electric passenger railways not engaged in the general business of transporting freight in addition to their passenger and express business, and railroads of a different character; nor shall the Commission have the right to establish any route, classification, rate, fare or charge when the transportation is wholly by water, and any transportation by water affected by this Act shall be subject to the laws and regulations applicable to transportation by water. And in establishing such through route the Commission shall not, except as provided in section 3, require any carrier by railroad, without its consent, to embrace in such route substantially less than the entire length, of its railroad and of any intermediate railroad operated in conjunction and under a common management or control therewith, which lies between the termini of such proposed through route, unless such inclusion of lines would make the through route unreasonably long as compared with another practicable through route which could otherwise be established: *Provided*, That in time of shortage of equipment, congestion of traffic, or other emergency declared by the Commission it may (either upon complaint or upon its own initiative without complaint, at once, if it so orders, without answer or other formal pleadings by the interested carrier or carriers, and with or without notice, hearing or the making or filing of a report, according as the Commission may determine) establish temporarily such through routes as in its opinion are necessary or desirable in the public interest.

"(4) Whenever there shall be filed with the Commission any schedule stating a new individual or joint rate, fare or charge, or any new individual or joint classification, or any new individual or joint regulation or practice affecting any rate, fare or charge, the Commission shall have, and it is hereby given, authority, either upon complaint or upon its own initiative without complaint, at once, and if it so orders without answer or other formal pleading by the interested carrier or carriers, but upon reasonable notice, to enter upon a hearing concerning the lawfulness of such rate, fare, charge, classification, regulation or practice; and pending such hearing and the decision thereon the Commission, upon filing with such schedule and delivering to the carrier or carriers affected thereby a statement in writing of its reasons for such suspension, may suspend the operation of such schedule and defer the use of such rate, fare, charge, classification, regulation or practice, but not for a longer period than one hundred and twenty days beyond the time when it would otherwise go into effect; and after full hearing, whether completed before or after the rate, fare, charge, classification, regulation or practice goes into effect, the Commission may make such order with reference thereto as would be proper in a proceeding initiated after it had become effective. If any such hearing can not be concluded within the period of suspension, as above stated, the proposed change of rate, fare, charge, classification, regulation or practice shall go into effect at the end of such period, but, in case of a proposed increased rate or charge for or in respect to the transportation of property, the Commission may by order require the interested carrier or carriers to keep accurate account in detail of all amounts received by reason of such increase, specifying by whom and in whose behalf such amounts are paid, and upon completion of the hearing and decision may by further order require the interested carrier or carriers to refund, with interest, to the persons in whose behalf such amounts were paid such portion of such increased rates or charges as by its decision shall be found not justified. At any hearing involving a rate, fare or charge increased after January 1, 1910, or of a rate, fare or charge sought to be increased after the passage of this Act, the burden of proof to show that the increased rate, fare or charge, or proposed increased rate, fare or charge, is just and reasonable shall be upon the common carrier, and the Commission shall give to the hearing and decision of such questions preference over all other questions pending before it and decide the same as speedily as possible."

Sec. 424. The seventh paragraph of section 16 of the Commerce Act is hereby amended to read as follows:

"(8) Any carrier, any officer, representative, or agent of a carrier, or any receiver, trustee, lessee, or agent of either of them, who knowingly fails or neglects to obey any order made under the provisions of sections 3, 13 or 15 of this Act shall forfeit to the United States the sum of $5,000 for each offense. Every distinct violation shall be a separate offense, and in case of a continuing violation each day shall be deemed a separate offense."

Sec. 437. The Commerce Act is further amended by inserting therein a new section between section 20 and section 21 to be designated section 20a, and to read as follows:

"Sec. 20a. (1) That from and after one hundred and twenty days after this section takes effect it shall be unlawful for any common carrier by railroad (except a street or electric interurban passenger railway not engaged in the general business of transporting freight in addition to its passenger and express business) which is subject to this Act, or any corporation organized for the purpose of engaging in transportation subject to this Act (hereinafter in this section called 'carrier'), to issue any share of capital stock or any bond or other evidence of interest in or indebtedness of the carrier (hereinafter in this section collectively termed 'securities') or to assume any obligation or liability as lessor, lessee, guarantor, indorser, surety or otherwise, in respect of the securities of any other person, natural or artificial, even though permitted by the authority creating the carrier corporation, unless and until, and then only to the extent that, upon application by the carrier, and after investigation by the Commission of the purposes and uses of the proposed issue and the proceeds thereof, or of the proposed assumption of obligation or liability in respect of the securities of any other person, natural or artificial, the Commission by order authorizes such issue or assumption. The Commission shall make such order only if it finds that such issue or assumption: (a) is for some lawful purpose compatible with the public interest, which is necessary or appropriate for or consistent with the proper performance by the carrier of service to the public as a common carrier, and which will not impair its ability to perform that service, and (b) is reasonably necessary and appropriate for such purpose.

"(2) The Commission shall have power by its order to grant or deny the application as made, or to grant it in part and deny it in part, or to grant it with such modifications and upon such terms and conditions as the Commission may deem necessary or appropriate in the premises, and may from time to time, for good cause shown, make such supplemental orders in the premises as it may deem necessary or appropriate, and may by any such supplemental order modify the provisions of any previous order as to the particular purposes, uses, and extent to which, or the conditions under which, any securities so theretofore authorized or the proceeds thereof may be applied, subject always to the requirements of the foregoing paragraph (1).

"(3) Every application for authority shall be made in such form and contain such matters as the Commission may prescribe. Every such application, as also every certificate of notification hereinafter provided for, shall be made under oath, signed and filed on behalf of the carrier by its president, a vice-president, auditor, comptroller or other executive officer having knowledge of the matters therein set forth and duly designated for that purpose by the carrier.

"(4) Whenever any securities set forth and described in any application for authority or certificate of notification as pledged or held unencumbered in the treasury of the carrier shall, subsequent to the filing of such application or certificate, be sold, pledged, repledged, or otherwise disposed of by the carrier, such carrier shall, within ten days after such sale. pledge, repledge or other disposition, file with the Commission a certificate of notification to that effect, setting forth therein all such facts as may be required by the Commission.

"(5) Upon receipt of any such application for authority the Commission shall cause notice thereof to be given to and a copy filed with the railroad commission, or public service or utilities commission, or other appropriate authority of each State in which the applicant carrier operates, or to the governor of such State. The railroad commissions, public service or utilities commissions, or other appropriate State authorities thus notified shall have the right to make before the Commission such representations as they may deem just and proper for preserving and conserving the rights and interests of their people and the States, respectively, involved in such proceeding. The Commission may hold hearings, if it sees fit, to enable it to determine its decision upon the application for authority.

"(6) The jurisdiction conferred upon the Commission by this section shall be exclusive and plenary, and a carrier may issue securities and assume obligations or liabilities in accordance with the provisions of this section without securing approval other than as specified herein.

"(7) Nothing herein shall be construed to imply any guaranty or obligation as to such securities on the part of the United States.

"(8) The foregoing provisions of this section shall not apply to notes to be issued by the carrier maturing not more than two years after the date thereof and aggregating (together with all other then outstanding notes of a maturity of two years or less) not more than 10 per centum of the par value of the securities of the carrier then outstanding. In the case of securities having no par value, the par value for the purposes of this paragraph shall be the fair market value as of the date of issue. Within ten days after the making of such notes the carrier issuing the same shall file with the Commission a certificate of notification, in such form as may from time to time be determined and prescribed by the Commission, setting forth as nearly as may be the same matters as those required in respect of applications for authority to issue other securities.

"(9) The Commission shall require periodical or special reports from each carrier hereafter issuing any securities, including such notes, which shall show, in such detail as the Commission may require, the disposition made of such securities and the application of the proceeds thereof.

"(10) All issues of securities and assumptions of obligation or liability contrary to the provisions of this section or of any order issued thereunder by the Commission shall be void. If any security so made void or any security in respect to which the assumption of obligation or liability is so made void, is acquired by any person for value and in good faith and without notice that the issue or assumption is void, such person may in a suit or action in any court of competent jurisdiction hold jointly and severally liable for the full amount of the damage sustained by him in respect thereof, the carrier which issued the security so made void or assumed the obligation or liability so made void, and its directors, officers, attorneys and other agents, who participated in any way in the authorizing, issuing, hypothecating or selling of the security so made void or in the authorizing of the assumption of the obligation or liability so made void. In case any security so made void was directly acquired from the carrier issuing it, the holder may at his option rescind the transaction and upon the surrender of the security recover the consideration given therefor. Any director, officer, attorney or agent of the carrier who knowingly assents to or concurs in any issue of securities or assumptions of obligation or liability forbidden by this section, or any sale or other disposition of securities contrary to the provisions of the Commission's order, or orders in the premises, or any application not authorized by the Commission of the funds derived by the carrier through such sale or other disposition of such securities, shall be guilty of a misdemeanor and upon conviction shall be punished by a fine of not less than $1,000 nor more than $10,000, or by imprisonment for not less than one year nor more than three years, or by both such fine and imprisonment, in the discretion of the court.

"(11) After December 31, 1921, it shall be unlawful for any person to hold the position of officer or director of more than one carrier, unless such holding shall have been authorized by order of the Commission, upon due showing, in form and manner prescribed by the Commission, that neither public nor private interests will be adversely affected thereby. After this section takes effect it shall be unlawful for any officer or director of any carrier to receive for his own benefit, directly or indirectly, any money or thing of value in respect of the negotiation, hypothecation or sale of any securities issued or to be issued by such carrier, or to share in any of the proceeds thereof, or to participate in the making or paying of any dividends of an operating carrier from any funds properly included in capital account. Any violation of these provisions shall be a misdemeanor, and on conviction in any United States court having jurisdiction shall be punished by a fine of not less than $1,000 nor more than $10,000, or by imprisonment for not less than one year nor more than three years, or by both such fine and imprisonment, in the discretion of the court."

Sec. 438. Section 24 of the Commerce Act is hereby amended to read as follows:

"Sec. 24. That the Commission is hereby enlarged so as to consist

of eleven members, with terms of seven years, and each shall receive $12,000 compensation annually. The qualifications of the members and the manner of payment of their salaries shall be as already provided by law. Such enlargement of the Commission shall be accomplished through appointment by the President, by and with the advice and consent of the Senate, of two additional Interstate Commerce Commissioners, one for a term expiring December 31, 1923, and one for a term expiring December 31, 1924. The terms of the present commissioners, or of any successor appointed to fill a vacancy caused by the death or resignation of any of the present commissioners, shall expire as heretofore provided by law. Their successors and the successors of the additional commissioners herein provided for shall be appointed for the full term of seven years, except that any person appointed to fill a vacancy shall be appointed only for the unexpired term of the commissioner whom he shall succeed. Not more than six commissioners shall be appointed from the same political party. Hereafter the salary of the secretary of the Commission shall be $7,500 a year."

Sec. 439. The Commerce Act is hereby further amended by adding at the end thereof two new sections, to read as follows:

"Sec. 25. That the Commission may, after investigation, order any carrier by railroad subject to this Act, within a time specified in the order, to install automatic train-stop or train-control devices, which comply with specifications and requirements prescribed by the Commission, upon the whole or any part of its railroad, such order to be issued and published at least one year before the date specified for its fulfillment: *Provided*, That a carrier shall not be held to be negligent because of its failure to install such devices upon a portion of its railroad not included in the order; and any action arising because of an accident happening upon such portion of its railroad shall be determined without consideration of the use of such devices upon another portion of its railroad. Any common carrier which refuses or neglects to comply with any order of the Commission made under the authority conferred by this section shall be liable to a penalty of $100 for each day that such refusal or neglect continues, which shall accrue to the United States, and may be recovered in a civil action brought by the United States.

"Sec. 26. That this Act may be cited as the 'Commerce Act, 1887.'"

Trays for Elevating Platform Industrial Trucks

THE LYON METALLIC MANUFACTURING COMPANY, Aurora, Ill., has developed a type of side frame to be used in making up trays or platforms for elevating platform industrial trucks, known as the Lyon steel skid leg.

The skid leg consists of two welded feet which are, in turn, welded to a steel channel. This channel is provided with bolt holes, which are spaced so as to make it convenient to bolt on either a wood or steel top. The legs have rounded corners and a wide bearing surface for preventing damage to floors and resisting lateral thrust.

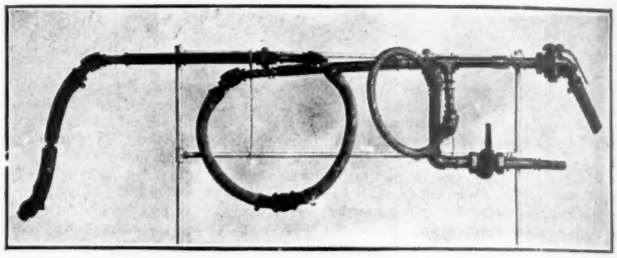
Additional supplies of platforms may be carried in stock,

The Load of Tin Plate on the Center Tray Is Greater Than the Lifting Capacity of a Truck, But Was Placed to Show What a Tray May Carry.

knocked down, so that they take up little space and yet may be quickly assembled. The wooden cross pieces may be drilled to fit the skid legs, which are punched to a standard pattern. All that is necessary to have a new platform complete and ready for use is to get out the required number of cross pieces and bolt them to the skid legs. The platforms may be made any width, as width depends only on the length of the cross pieces.

Emergency Connections For Brake Pipes

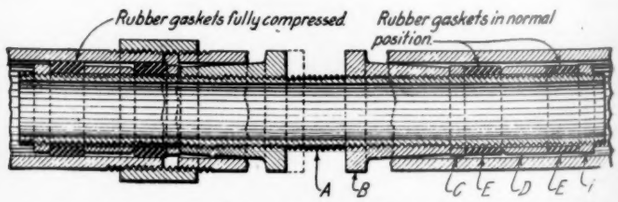
A METHOD OF COUPLING broken pipes which does away with the necessity of cutting threads has been devised by J. L. Boschart and is now being manufactured by the Broschart Threadless Pipe Coupling Company, Trenton, Mo. The object is to facilitate repairs in case of breakage of pipes forming part of the air brake or steam heating system either on locomotives or cars. In actual service as a part of the equipment carried on locomotives and cabooses, the threadless coupling has been found useful in preventing delays and engine failures, eliminating the necessity of switching cars to the rear of the train or



Method of Using the Emergency Connection in Making Temporary Repairs to Broken Brake Pipes

cutting them out with the consequent expense of sending a mechanic to make repairs.

As shown in the illustration the coupling consists of a short section of pipe *A*, which carries two jam nuts *B*, sleeves *C* and *D*, rubber gaskets *E*, and look nuts *F*. In case a break occurs in the train line, the ends are separated about four inches enabling the coupling to be inserted in the pipe. By turning the jam nuts, the rubber gaskets are compressed and forced out against the walls of the pipe making an air tight connection. If the break occurs at the end of a pipe coupling or union, the tapered end of the jam nut is sufficiently long to allow the gasket to extend through into the pipe and make a tight joint. By the use of other fittings



A Pipe Coupling Which Can Be Applied Without Tools

train lines can be connected even though the broken ends cannot be separated and in a similar manner angle cocks can be replaced and other air or steam pipes can be connected or plugged. The coupling can be applied without the use of any tools. It will withstand the standard train-line pressure and will not interfere with either service or emergency applications of the brakes.

Hog Island launched its fiftieth ship on August 23. The vessel was the S. S. Noble.

General News Department

Engineering Council has requested, and the Director of the Census, has ordered that the next census shall include a more detailed classification of engineers so that technical engineers will be listed separately from non-technical engineers (stationary engineers, locomotive enginemen, etc.), enabling anyone to ascertain readily the number of technical men in the United States and in each state. Technical engineers will be sub-divided between civil, mechanical, electrical and mining.

A committee of Engineering Council consisting of 16 engineers from all parts of the United States has for some time been studying the question of the licensing or registering of engineers. At a meeting held in Chicago recently a suggested form of statute was drafted which it is expected will be presented to Engineering Council at its December meeting for approval. The proposed law will then be available for use in the forming of legislation in those states in which there is a demand for the licensing of engineers. Eleven states have already passed such laws, but with widely differing provisions, while 17 have laws regulating the practice of architecture.

As It Looks to a "Literary Feller"

If the idea of the gentleman who suggested that we all work an extra hour a day were put into effect there would be one working man in the country who couldn't do it without actually overworking. The world's greatest gluttons for work are the men who take the trains out on the roads. This is not pure and simple devotion to duty. The pleasant prospect of overtime has a little something to do with it. The official working day on the road is eight hours long. The reason that the trainman gets a salary bigger than that of some of our most industrious governors is because he usually sleeps only eight hours out of 24 and spends every waking hour in building up his pay envelope. With a fair share of overtime an engineer's monthly pay runs up from $250 to $400.

He literally clamors for the chance to work. And as he can't go to work until the caller calls him and as the caller sometimes calls somebody else, he does most of his clamoring in the caller's ears. Sleep, with the road man, is a grudging concession to nature and the Interstate Commerce Commission, both of whom agree that he must have at least eight hours off duty. If he has worked steadily for more than 16 hours he must have 10 hours to himself. Of course, it is his own business whether or not he spends it in sleeping. He usually does because he wants to be in shape for another 16 hours of work as soon as he wakes up. And woe to the caller who calls him an hour too early or an hour too late. By the former contingency he loses sleep and by the latter he loses money.—R. S. Tompkins, in the Baltimore Sun.

Cost of Marine and Shipyard Strikes

The United States Shipping Board estimates that since the first of January, strikes have cost the Shipping Board a total of $37,000,000. Marine and harbor strikes, longshore strikes and shipyard strikes have occurred on the Atlantic, Pacific and Gulf coasts. The estimate does not include results of the coal strike, or losses by foreign or privately operated American vessels; nor indirect losses to the public due to interruption of regular movement of shipping, congestion in ports, spoilage of perishable cargo, etc. The marine strikes in New York harbor tied up 600 boats (16,000 men) for 13 days. In a marine strike in July some 25,000 men were out for about three weeks. A longshoremen's strike in New York in October involved 40,000 to 50,000 men for about thirty days. A further longshore strike occurred at New Orleans in the same month, lasting thirty-one days.

Among the 200 strikes in the shipyards, one of the largest was that in the Northern Pacific district, beginning in January, lasting for fifty days and involving some 40,000 men. In the San Francisco Bay and Southern district in October 35,000 men were out thirty days. A strike in the shipyards in the New York district began in October, lasted about thirty days and involved some 20,000 men.

New Industrial Conference Meets in Washington

The new industrial conference called by President Wilson to make another attempt to work out a plan for improving the relations between employers and employees began its sessions at Washington Monday, December 1, and entered upon a policy of working in non-public sessions, without stenographic record. Secretary of Labor W. B. Wilson was chosen chairman; Herbert Hoover, temporary vice-chairman, and Stanley King, temporary secretary. All of the members invited by the President were present except George T. Slade, who was said to be in Europe.

Elimination of Grade Crossings in Chicago

The question of the elimination of grade crossings in the city of Chicago has again come into notice in figures presented by Cook County Coroner P. M. Hoffman. Coroner Hoffman estimates that $94,972,561 has been spent in Chicago to eliminate grade crossings of railroads during the 27 years this work has been in progress. Approximately 963 grade crossings have been eliminated; yet deaths from grade crossing accidents are again increasing. At the end of the first seven years of track elevation work, deaths resulting from accidents of this nature began to decrease, but in 1916 there was an increase of almost 50 per cent. Since this time there has been some reduction, but the total for each year has remained above the record prior to 1916. At the same time the total number of railroad deaths in Chicago has not fluctuated in the same proportion nor at the same periods. The following compilation, prepared by Coroner Hoffman, illustrates this point:

Year	At grade crossings	Total R. R. deaths	Year	At grade crossings	Total R. R. deaths
1918	79	318	1911	62	334
1917	71	355	1910	68	381
1916	91	335	1909	68	329
1915	65	239	1908	55	270
1914	65	282	1907	84	393
1913	59	360	1906	100	371
1912	52	326			

The city track elevation bureau has prepared statistics concerning the expenditures by various roads for track elevation in Cook County. From the time grade separation work began in Cook County to January 1, 1919, the following expenditures have been made by railroads entering this district, according to the city track elevation bureau:

Road	Expenditures
Atchison, Topeka & Santa Fe	$990,000
Baltimore & Ohio	1,578,284
Baltimore & Ohio Chicago Terminal	5,856,593
Central Terminal	1,913,345
Chicago, Burlington & Quincy	4,263,000
Chicago Junction, yards	1,710,000
Chicago, Milwaukee & St. Paul	10,025,000
Chicago, Rock Island & Pacific	5,466,000
Chicago & Alton	1,133,277
Illinois Western	101,000
Western Indiana Belt	14,596,372
Chicago & North Western	13,900,770
Grand Trunk	732,000
Illinois Central	6,131,050
Indiana Harbor	598,000
Illinois Northern	321,700
New York Central	7,001,500
New York, Chicago & St. Louis	1,428,707
Pan Handle	6,386,836
Fort Wayne	9,156,000
Wabash	267,937
Total	$93,557,561

Alderman G. M. Maypole, chairman of the City Council committee on track elevation, has directed the committee's engineer to make a survey of all railroad grade crossings in the city with the purpose of making further recommendations.

REVENUES AND EXPENSES OF RAILWAYS

NINE MONTHS OF CALENDAR YEAR, 1919

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	141	1,338,412	565,304	2,040,303	387,145	459,674	16,928	837,536	78,820	1,796,916	88.08	243,388	100,251	142,928	—72,827
Alabama Great Southern	312	5,303,899	1,844,177	7,549,960	1,132,250	1,920,840	117,028	3,002,607	166,147	6,392,104	84.66	1,157,857	217,386	939,381	—689,179
Ann Arbor	301	2,450,401	535,718	3,156,624	468,146	533,853	42,676	1,474,495	96,589	2,616,298	82.88	540,327	143,100	396,762	346,068
Arizona Eastern	377	2,122,956	400,142	2,715,835	657,002	443,199	18,757	913,794	73,791	2,138,188	78.73	577,647	146,537	430,713	—591,680
Atchison, Topeka & Santa Fe	8,645	86,854,773	33,332,751	126,797,080	17,145,774	29,586,587	270,007	45,270,649	2,267,076	95,159,339	75.05	31,637,741	5,049,263	26,559,428	—4,326,085
Atlanta & West Point	93	939,815	855,741	2,001,849	244,587	369,773	27,557	759,780	58,099	1,484,933	74.17	516,916	76,506	440,374	—75,693
Atlanta, Birmingham & Atlantic	639	2,760,263	706,201	3,701,458	878,789	1,140,972	64,227	1,130,885	111,019	4,326,597	116.88	—625,138	144,000	—770,527	—496,493
Atlantic City	177	1,078,015	2,390,333	3,629,113	413,990	439,088	15,127	1,692,426	11,773	2,573,249	70.91	1,055,864	108,000	947,864	61,445
Atlantic Coast Line	4,863	29,272,197	14,091,257	46,276,518	6,988,641	10,218,240	539,070	20,634,763	993,497	39,636,280	85.65	6,640,239	1,910,000	4,714,492	—3,912,366
Baltimore & Ohio Chicago Terminal	90	.....	3,052	1,418,799	301,575	410,575	10,285	1,109,692	76,587	1,951,957	137.57	—533,159	249,549	—783,272	83,248
Baltimore & Ohio	5,151	98,165,206	24,756,516	132,609,923	20,179,673	41,761,498	1,432,598	57,743,544	3,384,418	12,543,970	94.58	7,176,953	3,235,608	3,930,604	—6,487,516
Baltimore, Chesapeake & Atlantic	87	759,186	413,408	1,216,507	138,067	367,699	9,312	697,589	31,361	1,244,028	102.26	—27,521	30,150	—57,671	90,419
Bangor & Aroostook	632	2,847,498	687,115	3,721,675	801,810	1,046,802	34,801	1,450,063	111,799	3,498,533	94.00	223,142	189,000	32,232	—288,039
Beaumont, Sour Lake & Western	118	699,012	224,317	968,625	237,677	174,791	17,414	421,020	45,731	896,033	92.50	72,592	24,300	48,120	—291,797
Belt Ry. Co. of Chicago	31	.....	.....	2,722,238	241,470	496,482	3,250	1,612,112	71,761	2,425,076	89.08	297,162	139,425	157,736	185,199
Bessemer & Lake Erie	217	9,360,737	378,273	9,981,922	1,111,963	2,976,850	96,095	3,085,558	173,466	7,436,839	74.44	2,551,083	130,506	2,420,452	—744,254
Bingham & Garfield Ry	37	793,958	18,484	847,188	353,178	361,578	11,720	243,233	38,092	1,027,999	121.34	—180,811	66,644	—247,455	—1,406,707
Birmingham Southern	29	327,509	.....	432,638	36,833	55,485	6,332	209,927	29,479	338,057	78.18	94,582	16,303	77,353	—148,248
Boston & Maine	2,258	30,581,068	16,557,654	52,451,127	7,233,366	10,108,289	358,429	27,773,194	1,529,245	47,318,619	90.21	5,132,507	1,608,760	3,522,926	—1,846,073
Buffalo, Rochester & Pitts	589	8,961,485	1,182,285	10,556,712	1,758,022	3,741,685	131,288	5,077,314	295,311	11,023,179	104.42	—466,467	243,000	—710,004	—1,583,847
Buffalo & Susquehanna	296	1,547,083	61,982	1,696,795	384,044	844,726	16,067	576,582	69,742	1,891,161	111.45	—194,366	29,750	—223,616	—294,236
Canadian Pacific Ry. Line in Maine	233	1,444,877	461,662	2,013,442	464,377	459,524	23,390	1,257,483	31,711	2,235,750	111.04	—222,308	99,000	—321,308	—66,603
Charleston & Western Carolina	342	1,650,088	462,449	2,211,722	411,839	423,020	40,263	1,064,749	48,557	1,988,429	89.90	223,494	76,500	146,754	—142,546
Central New England	301	4,422,675	220,387	4,851,775	1,166,626	909,865	24,723	2,207,976	128,447	4,444,258	91.60	407,517	144,517	262,453	—335,851
Central of Georgia	1,918	9,508,889	4,775,737	15,739,993	3,050,317	3,284,510	309,122	6,784,240	529,546	13,964,871	88.73	1,773,122	557,257	1,208,719	—1,836,137
Central of New Jersey	685	24,081,567	6,439,121	32,895,635	3,970,073	8,495,423	219,835	15,485,051	769,089	2,907,019	88.39	3,817,616	1,592,716	2,224,739	—3,633,507
Central Vermont	411	3,091,336	801,063	4,267,451	863,201	1,087,506	68,998	2,615,326	158,572	4,807,949	112.66	—540,498	156,600	—697,264	—458,401
Carolina, Clinchfield & Ohio	282	3,984,237	307,716	4,369,817	683,708	1,096,589	41,644	1,353,055	123,519	3,297,733	75.46	1,072,083	146 700	925,297	178,754
Chesapeake & Ohio	2,503	39,409,486	11,201,015	53,673,732	8,654,958	11,821,625	327,019	20,808,407	999,738	42,898,723	79.92	10,775,009	1,502,040	9,268,569	—2,049,193
Chicago & Alton	1,050	12,804,894	4,803,026	18,691,456	3,160,120	5,160,293	229,127	7,921,118	439,134	16,992,645	90.91	1,698,811	560,180	1,136,972	—1,099,712
Chicago & Eastern Illinois	1,131	13,387,075	3,649,498	18,359,068	2,836,757	6,531,040	194,856	7,802,466	425,006	17,852,952	97.24	506,115	692,592	—189,875	—1,534,143
Chicago & Erie	269	6,151,907	898,149	7,666,216	876,501	1,303,254	95,600	3,866,856	251,596	6,419,037	83.73	1,247,179	266,965	980,122	873,114
Chicago & North Western	8,090	67,195,175	26,354,834	102,112,652	15,526,935	21,054,610	662,426	45,733,401	2,240,660	85,997,691	84.21	16,114,961	4,275,000	11,831,803	2,551,671
Chicago, Burlington & Quincy	9,373	77,283,601	26,579,287	112,204,197	16,792,487	22,416,789	801,101	4,297,757	2,845,309	86,951,199	77.49	25,252,988	4,057,675	21,172,835	3,109,543
Chicago Great Western	1,496	10,406,271	4,568,052	16,108,560	2,693,939	3,610,957	234,491	6,891,556	405,813	13,955,561	86.63	2,152,999	513,289	1,638,145	366,803
Chicago, Indianapolis & Louisville	657	6,046,589	2,139,205	8,979,269	1,060,690	2,253,020	125,785	3,770,529	233,243	7,528,299	83.84	1,450,970	352,572	1,097,170	109,846
Chicago Junction	12	.....	.....	2,697,531	634,749	451,524	920	2,033,766	63,074	3,184,033	118.03	—486,502	24,460	—511,045	—233,481
Chicago, Milwaukee & St. Paul	10 647	77,505,162	22,937,857	110,262,257	17,162,785	30,895,851	812,987	50,151,880	2,832,236	102,269,959	92.75	7,992,297	4,737,841	3,228,990	—2,396,883
Chicago, Peoria & St. Louis	247	919,113	225,328	1,221,496	341,264	590,219	25,496	758,560	78,053	1,793,578	146.83	—572,083	62,666	—634,764	—370,323
Chicago, Rock Island & Gulf	474	2,489,114	778,773	3,470,078	591,996	660,371	62,434	1,534,773	106,068	2,964,153	85.42	505,925	118,393	387,107	—385,378
Chicago, Rock Island & Pacific	7,594	52,265,927	23,490,794	80,405,590	13,268,227	18,126,758	929,134	34,288,499	1,797,487	68,722,875	85.47	11,682,515	3,111,834	8,565,882	904,678
Chicago, St. Paul, Minn. & Omaha	1,749	12,885,853	5,659,807	19,863,311	2,927,696	3,634,305	188,561	9,311,240	542,785	16,729,811	84.22	3,133,501	960,631	2,169,394	101,288
Chicago, Terre Haute & S E	374	2,791,458	197,031	3,068,136	495,128	1,366,359	28,282	1,175,867	78,950	3,158,993	102.96	—90,856	130,500	—221,375	—534,211
Cincinnati, Indianapolis & Western	371	1,566,254	483,011	2,256,174	427,805	701,826	46,446	1,191,311	119,708	2,494,753	110.57	—238,579	96,500	—335,088	—286,375
Cincinnati, New Orleans & Texas Pacific	337	8,555,661	2,774,843	11,912,564	1,655,241	3,864,382	202,053	4,769,815	308,208	10,867,908	91.23	1,044,656	343,119	697,744	—1,082,188
Cincinnati Northern	251	1,926,500	173,012	2,156,945	322,055	484,811	19,887	757,391	43,585	1,627,729	75.46	529,216	85,300	443,760	268,597
Cleveland, Cincinnati, Chicago & St. L	2,395	36,256,163	12,769,953	53,092,126	6,606,109	10,329,747	686,465	21,449,519	981,521	40,473,791	76.23	12,618,336	1,620,000	10,983,441	—1,200,586
Colorado & Southern	1,100	7,247,301	1,900,376	9,683,515	1,592,796	2,239,462	77,172	3,579,286	316,617	7,870,878	81.28	1,812,638	423,000	1,386,029	—570,224
Colorado & Wyoming	41	214,295	10,703	822,935	98,983	153,437	1.291	371.158	34,270	659,139	80.10	163,795	36,000	127,795	—36,399
Cumberland Valley	163	3,310,116	651,098	4,233,709	760,957	953,076	58,153	1,646,439	103,461	3,528,377	83.34	705,333	75,962	629,108	—856,103
Delaware & Hudson	875	21,770,700	2,475,128	25,690,260	3,222,863	7,257,655	178,751	11,304,065	973,225	23,210,115	290.34	2,480,145	540,000	1,932,939	—1,156,735
Delaware, Lackawanna & Western	956	38,133,020	9,333,000	52,975,984	5,504,045	11,198,399	378,160	22,422,578	1,016,846	41,056,754	77.50	11,918,231	2,812,575	9,084,729	—2,429,078
Denver & Rio Grande	2,595	16,991,922	5,135,220	23,543,080	3,704,417	5,788,767	175,891	8,014,043	621,904	18,687,221	79.37	4,855,860	960,000	3,891,610	543,992
Denver & Salt Lake	255	1,692,550	348,610	2,104,578	670,402	797,218	8,496	1,169,287	45,398	2,690,801	127.85	—586,223	81,000	—667,362	—232,509
Detroit & Mackinac	381	836,043	285,482	1,186,829	202,886	329,290	26.576	565,497	90.266	1,213.898	102.28	—27,070	70,358	—97,428	—149,771
Detroit, Toledo & Ironton	456	2,432,599	119,242	2,718.194	802,041	868,208	25,503	1,280,610	115,552	3,091,964	113.75	—373,771	73,371	—447,490	—145,087
Detroit & Toledo Shore Line	61	1,786,547	.....	1,819,223	168,732	173,930	9,328	510,971	36,237	898,609	49.39	920.613	84,296	836,311	310,365
Duluth & Iron Range	292	6,119,251	201,830	6,794,118	751,004	849,686	4,314	1,654,593	128,254	3,390,125	49.89	3,403,993	342,843	3,060,479	—329,933
Duluth, Missabe & Northern	411	14,920,983	401,748	16,469,544	1,390,924	1,227,659	19,455	2,829,515	176,242	5,655,834	34.34	10,813,709	642,219	10,171,490	321,959
Duluth, Missabe & Northern	599	2,378,323	915,647	3,516,034	737,121	628,348	50,518	1,662,686	84,046	3,206,746	91.20	309,288	183,003	126,086	—91,950
Duluth, Winnipeg & Pacific	178	1,147,066	217,855	1,412,360	277,332	273,433	22,846	623,954	71,861	1,275,984	90.34	136,375	75,397	60,977	—7,926
East St. Louis Connecting	3	.....	.....	900,350	132,278	214,925	2,530	587,218	30,626	968,057	107.52	—67,708	22,744	—90,452	—38,913
El Paso & Southwestern	1,027	7,211,868	1,600,749	9,292,875	1,517,293	1,870,766	88,633	2,584,465	227,299	6,355,703	68.39	2,937,271	477,810	2,459,004	—1,798,014
Elgin, Joliet & Eastern	828	12,857,146	93	14,976,403	1,358,756	3,748,151	60,569	5,738,591	232,233	11,136,729	74.36	3,839,674	489,020	3,350,731	5,187
Erie	1,989	50,888,755	10,429,659	67,298,016	8,040,880	21,401,487	560,275	32,749,703	1,808,278	64,935,193	96.48	2,362,823	2,320,572	25,111	4,297,555
Florida East Coast	764	4,327,340	2,284,461	7,448,021	1,247,185	1,372,499	70,162	3,346,503	154,695	6,278,277	84.29	1,169,744	347,360	819,810	—792,801
Fonda, Johnstown & Gloversville	88	307,028	595,095	939,784	101,642	80,007	5,720	359,997	45,344	592,710	63.06	347,075	49,100	297,975	—1,830
Ft. Smith & Western	253	907,145	250,512	1,130,837	212,947	275,622	33,213	410,186	57,461	994,332	87.92	136,507	45,000	90,628	30,104
Ft. Worth & Denver City	454	5,212,926	2,500,659	8,029,924	763,361	1,552,581	38,925	2,906,716	223,286	5,511,751	68.64	2,518,174	169,226	2,347,873	1,381,600
Ft. Worth & Rio Grande	235	588,193	473,050	1,135,758	249,311	205,639	10,536	579,306	53,892	1,098,682	96.74	37,074	27,075	9,288	—50,579

Commission and Court News

Interstate Commerce Commission

Commission Requires Additional Traffic Statistics

The Interstate Commerce Commission has issued an order requiring class I and class II carriers, beginning with January 1, 1920, to compile freight traffic statistics monthly, and report them quarterly and annually to the commission showing the number of carloads, the number of tons of 2,000 pounds originating on respondent's line, and the number of tons received from connecting carriers of 69 commodities and l. c. l. merchandise.

As a special study covering waybills included in accounts for the month of April, 1920, but not thereafter until further order, carriers of class I are to compile and report additional data for the 15 following classes of commodities: Wheat, corn, cotton, fruits and vegetables, cattle and calves, hogs, fresh meats, bituminous coal, lumber, timber, box shooks, staves and headings, refined petroleum and its products, sugar, syrup, glucose and molasses, bar and sheet iron, structural iron and iron pipe, cement, automobiles and auto trucks, and fertilizers.

For each of the above classes, there shall be reported for the received tonnage only, except as otherwise provided below, the number of carloads, the number of tons (of 2,000 pounds), the total revenue, the state in which the point waybilled from is situated, and the state of the waybill destination. So far as practicable, the revenue reported by each carrier shall correspond to the state-to-state movement which it reports. On shipments to or from Canada, or Mexico, the revenue reported shall be only the proportion accruing to the respondents within the United States. The state waybilled from and the state waybilled to shall govern on rebilled traffic.

The data is to be compiled from the audited records covering local traffic including shipments rebilled at junctions with other than class I roads), and inbound interline traffic, including traffic moving to other than class I roads, to Canada, to Mexico, and to all other countries, when such traffic is waybilled to the junction points of delivery to other than class I or foreign carriers. When such traffic is waybilled through, class I carriers shall include in their reports traffic delivered on through billing to all other than class I roads. Interline accounts rendered by such carriers will be used to obtain the data. No adjustment of revenues or tonnage will be required on account of transit privileges at intermediate points.

Court News

Actions Against Government Owned Railroad Corporation

The Circuit Court of Appeals, Ninth Circuit, holds that the United States, by its purchase of the property, stock and bonds of the Alaska Northern, under authority of Act of Congress, March 12, 1914, became the owner, not only of the property, but of the corporation and is now its agent for governmental and public purposes; and without its consent the corporation cannot be sued in tort.—Ballaine v. Alaska Northern, 259 Fed. 183. Decided July 7, 1919.

Erroneous Quotation of Interstate Rates

The Arkansas Supreme Court holds, following I. C. v. H. E. Co., 226 U. S. 441, 33 Sup. Ct. 176, that an interstate carrier cannot be mulcted in damages by a shipper for failure to post its freight rates, as fixed by the Interstate Commerce Commission, in its station, or for misquoting the existing rate. The question arose in an action to recover undercharges on an interstate shipment of lumber, where the station agent, having received no notice of an advance in freight from 10½ cents to 13 cents, quoted the old rate to the shipper. Judgment was directed for the railroad.—St. Louis, I. M. & S. v. Wood (Ark.), 207 S. W. 32.

Federal Operation—Repair of Bridges

General Order No. 50 relates to actions at law, etc., and requires suits to be brought against the Director General of Railroads and not otherwise; and the rule shall not apply to proceedings for the recovery of fines, penalties or forfeitures. The rule has no application to a proceeding to compel the performance of a duty required by statute (in this case to repair a bridge over a railroad's tracks). The fact that the Director General has control or management of the affairs of a railroad company does not excuse the railroad from performing any duty owing to the state.—*In re* Morris Ave. Bridge in City of New York, Supreme Court, Special Term, 174 N. Y. Supp. 682.

Stop—Look—Listen Rule

In a crossing accident case the Arkansas Supreme Court, while recognizing that some courts hold that it is the duty of a traveler to stop and look and listen for the approach of a train, says: "We have not laid down the rule so strictly, but have uniformly held that a person who would pass over a railroad track at a crossing or elsewhere must do all that a man of ordinary care would do under similar circumstances to avoid any probable or possible danger from a passing train, and, if need be, stop as well as look and listen. Whether such care requires stopping as well as looking and listening depends upon whether, without it, the danger to be apprehended could be so well ascertained and avoided.—St. L.-S. F. v. Stewart (Ark.), 207 S. W. 440.

United States Supreme Court

Effect of Federal Control—Injuries to Passengers and to Freight

In an action against the Director of Railroads and the Missouri Pacific for an injury to a passenger, the railroad demurred (1) because the complaint did not sustain a sufficient cause of action against it, and (2) because the plaintiff had not a lien on the railroad for the damage alleged. The federal district court for the Western District of Arkansas sustained the demurrer, holding that under the acts of 1916 and 1918, and Presidential Proclamation of 1917, and in view of General Order No. 50, action cannot be maintained against a railroad company for injuries to a passenger resulting from negligence of its employees after the President had assumed control of the railroads, for the act of 1918 did not annul the previous presidential proclamation as to orders of the Director General, and the employees of the railroad being no longer subject to the orders of the railroad company, the maxim respondent superior (let the master answer) does not apply.—Mardis v. Hines, 258 Fed. 945. Decided July 17, 1919.

The federal district court for the District of Colorado holds that under the 1916 and 1918 acts a railroad cannot be made liable for injuries to shipments while the government has taken over the entire operation of the road, though section 10 of the 1918 act subjects the carrier to all laws and liabilities, whether arising under state or federal law, or at common law.—Hatcher v. Atchison, T. & S. F., 258 Fed. 952. Decided June 25, 1919.

The federal district court for the Northern District of Ohio holds that within the Federal Control Act March 21, 1918, section 10, subjecting carriers, while under federal control, to all liabilities as common carriers, except so far as may be inconsistent with the provisions of the act, and permitting actions to be brought and judgments rendered as now provided by law, it would be inconsistent with all the provisions of the act to subject a railroad company to liability for acts and conduct of public agents operating its property under federal control. [Citing Rutherford v. Union Pacific, 254 Fed. 880. The court did not agree with such holdings to the contrary as it had seen. It concluded: "It will not be assumed that the United States will terminate federal control and cover into the United States treasury the residue of the revolving fund and excess income, if any, without providing for debts and liabilities incurred during federal control."—Maubert v. B. & O., 259 Fed. 361. Decided September 3, 1919.

Foreign Railway News

Exports of Car Wheels and Axles in September

The exports of car wheels and axles in September reached a total value of $1,013,440 as compared with a total of $1,302,546 in August. Of the September exports, large shipments were made to Japan, France and British India. The detailed figures as compiled by the Division of Statistics of the Bureau of Foreign and Domestic Commerce are as follows:

Countries	Dollars
France	210,864
Italy	36,663
Canada	11,335
Honduras	1,562
Nicaragua	116
Panama	102
Mexico	4,594
Cuba	26,597
French West Indies	544
Dominican Republic	1,370
Brazil	36,897
Chile	32
Ecuador	3,981
British Guiana	426
Venezuela	41
China	1,003
Japanese China	55,167
British India	123,730
Dutch East Indies	79,761
Japan	409,106
Australia	7,292
Philippine Islands	2,221
British South Africa	36
Total	1,013,440

Exports of Locomotives in September

The exports of locomotives in September totaled 78, of a value of $2,326,339. This total was considerably larger than the totals for July and August, but not as great as in May or June. Of the September total of 78 locomotives, 15 were consigned to Cuba and 14 to Japanese China. The detailed figures as compiled by the Bureau of Foreign and Domestic Commerce are as follows:

Countries	Number.	Dollars.
France	2	75,550
Norway	3	60,450
Canada	5	37,674
Cuba	15	306,755
Argentina	3	94,600
Brazil	6	189,600
Ecuador	1	10,650
China	4	199,000
Japanese China	14	701,800
British India	4	44,160
Straits Settlements	6	170,700
Dutch East Indies	1	4,500
Japan	3	27,900
Russia in Asia	2	90,000
Philippine Islands	1	2,000
Portuguese Africa	8	311,000
Total	78	2,326,339

Avoiding Prussian Railways

The Inter-Allied schemes for the provision of international railway routes which shall so far as possible avoid German and Austrian territory, are causing alarm in commercial circles in Germany. Owing to the Orient express, for instance, which runs to Constantinople and Athens, being arranged to travel in future, via Venice, Trieste and Belgrade, thus avoiding Vienna and Budapest, which were formerly on the route, two celebrated connecting trains, the Hamburg-Berlin-Vienna and the Berlin-Oderberg-Budapest expresses, will find their occupation gone. Similarly, the famous "Nord Express," to Russia and the Far East, which before the war provided a very striking example of the extent to which international communications depended on Germany, will no longer run via Cologne and Berlin, which in turn affects two other connecting trains,, the Frankfort-Berlin and Hamburg-Berlin expresses. The German route to Copenhagen, formerly giving the quickest service to and from London, loses its monopoly of speed, while the route between Switzerland, Cologne and Frankfort has already given way to the Franco-Belgian route via Brussels and Strasbourg. German commercial fears at the result of this isolation in transport matters are shown demonstrated by the fact that one of the reasons for the establishment of the great industrial exhibition at Frankfort, which is to be held twice a year, is the hope of salvaging some of the international traffic. The main station at Frankfort, it should be added, is one of the largest, finest and costliest in the world, and most of the capital expenditure incurred in building it was undertaken because of the pre-war importance of the city as an international traffic centre.

Exports of Railway Track Material in September

The exports of spikes in September amounted to 4,298,046 lbs. valued at $179,197; of rails 58,424 tons valued at $3,403,771 and of switches, frogs, splice bars, etc., to the value of $473,753. Of the shipments of rails and switches, etc., Japan was the largest customer, while in the case of spikes, it was second. The figures in detail as compiled by the Division of Statistics of the Bureau of Foreign and Domestic Commerce, were as follows:

	Spikes		Steel Rails	Switches, frogs, Splice Bars, etc.	
Countries	Pounds	Dollars	Tons	Dollars	Dollars
Belgium	.....	.....	451	31,570	2,125
Denmark	13,440	525	225	18,975	525
France	1,210,120	57,163	2,148	144,322	21,040
Norway	.....	.....	501	25,018	2,340
Sweden	14,433	300	401	22,456	3,440
England	.....	.....	591	35,937	15,830
Scotland	.....	.....	1,094	69,141	1,769
British Honduras	39,204	1,005	277	18,035	723
Canada	67,520	2,651	778	46,920	38,616
Costa Rica	35,600	1,430	184	9,529	15
Guatemala	300	12	.....	.....	3,880
Honduras	179,200	4,064	2,315	118,241	2,193
Nicaragua	.....	.....	.....	.....	494
Panama	39,000	1,755	287	14,372	1,243
Salvador	41,500	1,942	286	14,200	142
Mexico	38,962	2,191	797	14,873	3,035
Miquelon, Langley, etc.	200	17	.....	.....	.....
Newfoundland and Labrador	.....	.....	4	345	.....
Jamaica	19,273	747	40	2,336	3,907
Trinidad and Tobago	.....	.....	12	1,073	.....
Other British West Indies	10,480	418	.....	.....	.....
Cuba	544,396	19,073	6,325	343,203	58,834
French West Indies	15,124	1,072	225	12,000	90
Haiti	10,000	355	.....	.....	70
Dominican Republic	17,300	788	99	5,044	5,317
Argentina	.....	.....	7	655	49
Brazil	110,780	4,106	430	30,084	1,468
Chile	263,000	11,248	607	32,001	67
Colombia	.....	.....	249	14,492	12,430
Ecuador	7,225	298	.....	.....	624
British Guiana	.....	.....	691	36,105	.....
Peru	21,040	804	1,180	92,121	2,505
Uruguay	109,361	4,036	.....	.....	.....
Venezuela	2,264	133	.....	.....	1,060
China	197,073	3,185	11	587	526
Japanese China	159,500	6,743	4,785	238,133	33,460
British India	3,941	93	55	3,206	1,540
Other Brit. East Indies	.....	.....	.....	.....	1,923
Dutch East Indies	144,745	10,114	1,153	91,180	9,377
Hongkong	.....	.....	605	49,610	2,331
Japan	497,365	23,186	24,373	1,408,441	170,494
Russia in Asia	120,400	3,940	.....	.....	5,149
Siam	.....	.....	.....	.....	7,963
Philippine Islands	303,800	11,006	3,785	203,308	33,633
British South Africa	61,500	4,797	3,417	224,251	22,371
French Africa	.....	.....	36	2,007	1,155
Total	4,298,046	179,197	58,424	3,403,771	473,753

England's Railway Rates Advisory Committee

LONDON.

Sir Eric Geddes, Minister of Transport, has appointed F. Gore-Browne, K.C., nominated by the Lord Chancellor as chairman of the Railway Rates Advisory Committee; Lionel A. Martin, representative of trade, nominated by the Board of Trade; W. W. Berry, representative of agriculture, nominated by the Board of Trade; W. J. Davis, representative of labor, nominated by the Minister of Labor; W. A. Jepson, representative of transportation, nominated by the Minister of Transport; W. M. Acworth, additional member for question of immediate increase of rates, nominated by Minister of Transport.

This committee will ultimately have to advise the Minister of Transport on the question of a general revision of the bases of rates and charges on railways. The present classification of freight traffic and the statutory powers for its conveyance were based on conditions prevailing some 30 years ago. When the maximum rates were fixed in 1891 and 1892 the various commodities were divided into eight classes. Rates have been provided for the eight classes on a fairly uniform scale throughout the country, but not more than one-fourth of the total business is carried at those class rates, the remaining three-fourths being carried at what are known as "exceptional" rates, which are lower than the class rates, with the result that a most complex

system of varying rates has been built up. It is also pointed out that there is a great want of elasticity about the present system.

Exports of Freight and Passenger Cars in September

The exports of freight cars in September totaled 1,774, valued at $3,538,002, of which the larger portion were consigned to France. The exports of passenger cars totaled 12, all consigned for Mexico. The detailed figures as compiled by the Division of Statistics of the Bureau of Foreign and Domestic Commerce, are as follows:

Countries	Passenger Number	Passenger Dollars	Freight and Other Number	Freight and Other Dollars
France	..	.....	1,500	3,162,010
Norway	..	.....	30	66,375
Sweden	..	.....	20	43,600
Canada	..	.....	36	27,750
Mexico	12	81,975	4	2,862
Cuba	..	.....	11	10,050
Dominican Republic	..	.....	20	25,175
Peru	..	.....	10	4,180
China	..	.....	8	15,300
Hongkong	..	.....	4	10,200
Russia in Asia	..	.....	100	170,000
Philippine Islands	..	.....	1	500
Total	12	81,975	1,774	3,538,002

The Nationalization of French Railways

LONDON.

The Federation of Railwaymen and, with it, the whole of the socialist party, has risen against the tariff increase announced by the Finance Minister. Both socialists and syndicalists see in nationalization a remedy for the deficit.

One can certainly adduce argument in favor of the working of the railways by the state, says Agence Radio in the Journal des Transports, Paris, but to claim to have found in such a measure the means of solving the financial crisis which is affecting our system, is to set one's face against the most conspicuous facts.

The coefficient of railway working, that is to say, the ratio between the cash receipts and working expenditure only (financial charges, interest and capital redemption of shares and debentures not included) was as follows in 1918:

	Per cent		Per cent
Orleans	85	East	96
Midi	87	North	112
Paris, Lyons & Mediterranean.	90	State (et al.)	120

This means that the state railways exceed even the coefficient of the two railways which operate in the war zone and which were deeply affected by the war.

The only system which may be fairly compared with the State is that of Orleans, the composition, geographical position and traffic of which are almost similar. Now, during the last ten years, the coefficient of working of Orleans fluctuated between 52 per cent and 85 per cent, whereas that of the State varied between 68 per cent and 120 per cent.

The Orleans deficit reaches 241,000,000; if it had worked at the same price as the State, its immediate neighbor, its deficit would have reached over 1,200 millions.

These figures cannot be refuted and they are not, at all events. To represent nationalization, under those conditions, as a means of re-establishing the balance of exploitation without raising the tariffs, means, either to ignore the facts, or to deny the well-tried power of experience.

If it is wished that the State should be the future sole owner of all railway systems of general utility, and at the same time, however, leave the exploitation a certain elasticity, a certain independence, relieve it from the strict forms and rules of public administration, it might be possible to apply to the railways the system of "Régie intéressée (exploitation under the State's supervision) which has been well tried, particularly in connection with the municipal gas supply of Paris.

But one cannot repeat too often that this is a solution for the future, an administrative solution, which does not do away with the deficit incurred in the past and which does not ensure financial equilibrium for the future.

Only a little common sense will suffice to realize that no industry, whatever the system may be (concession, "régie intéressée," or direct management) cannot be compelled to work below the cost price.

Supply Trade News

Sidney Williams, who was for 15 years assistant director of purchases and assistant to the vice-president of the Union Pacific, until the change in organization was made by the United States Railroad Administration, is now vice-president of the United Products Company, exporters, at 66 Broadway, New York.

The Standard Asphalt & Refining Company, Chicago, has made arrangements with the **Insulite Products Company, Inc.,** Railway Exchange Building, Portland, Ore., to handle its products. The Insulite Products Company is a new company which has been organized recently under the management of **F. B. Gilman,** formerly of the F. B. Gilman & Co. Branch offices are to be opened in Spokane, Wash.; Tacoma, Seattle; San Francisco, Cal.; and Los Angeles.

Trade Publications

FORGING.—A series of pamphlets entitled National Forging Machine Talks is being distributed by the National Machinery Company, Tiffin, Ohio. No. 36 describes a method of forming the eyes on brake hangers.

LOCOMOTIVE REPAIR SHOP DESIGN.—The Austin Company, Cleveland, Ohio, has issued an attractive pamphlet containing a reprint of an article published in the August 8, 1919, issue of the *Railway Age,* under the title "The Design of Locomotive Repair Shops," by Gustave E. Lemmerich.

SHOP ACCESSORIES.—Armstrong Brothers Tool Company, Chicago, has recently issued its general catalogue B-17, covering the complete line of tool holders, ratchet drills, lathe dogs, clamps and wrenches which this company manufactures. Among the new products listed are special tool holders for use with Stellite cutters and a safety pulley hanger for mounting split pulleys.

MILLIKEN BUILDINGS.—The Milliken Brothers Manufacturing Company, Inc., New York, has issued catalogue No. 10, illustrating and describing Milliken buildings and steel specialties, including transmission towers, radio towers and pinlock poles. This booklet is supplemented by catalogue No. 11, an erection handbook which is designed as a guide for the erection of buildings.

TWIST DRILLS.—The manufacture of Celfor drills is described in an interesting manner in a booklet, entitled "Putting Mettle Into Metal," issued by the Clark Equipment Company, Buchanan, Mich. The successive operations in the making and testing of drills are illustrated and described. A portion of the book contains views of the company's plant, together with the hospital and recreational facilities provided for the employees.

BLAW FORMS FOR LIGHT WALLS AND FOUNDATIONS.—A 28-page pamphlet, recently issued by the Blaw-Knox Company, Pittsburgh, Pa., as Bulletin No. 203, is devoted to the advantages of this type of form. It is well illustrated, showing to some extent the variety of work for which these forms are adapted, while considerable space is given to describing in detail the method of assembling and applying them to different types of construction.

ERIE SHOVELS.—The Ball Engine Company, Erie, Pa., has issued Bulletin S-36, a large six-page folder, with 12 illustrations, devoted to the use of Erie shovels in handling rock. The illustrations show actual conditions under which these shovels have worked and the classes of material handled. Data on the amount moved, time and cost, etc., are furnished through the medium of letters from owners who are using the Erie shovel in rock work.

TYPICAL GRAPHIC RECORDS.—The Esterline Company, Indianapolis, Ind., has issued a 24-page pamphlet containing a large number of typical charts produced by automatic recording instruments. While intended primarily to illustrate the character of work accomplished by these instruments, many interesting facts

concerning power input and output and load variation, with different classes of industrial equipment, are demonstrated by the charts.

STEEL CASTINGS.—Harrison Steel Castings is the title of a profusely illustrated book issued by the Harrison Steel Castings Company and the National Car Coupler Company, Chicago. After a brief account of the origin of steel castings, data concerning the company's plant is given and the successive steps in the manufacture of a steel casting are illustrated and described. The book forms a very interesting non-technical treatise on the manufacture of steel castings.

BLAW FORMS FOR BUILDINGS.—The Blaw-Knox Company, Pittsburgh, Pa., has recently acquired the patents, personnel and equipment of the Uniform Company of Boston and has taken up the manufacture and sale of forms for reinforced concrete building construction developed by the Uniform company. The nature of these forms, and their application to various purposes, is described and illustrated in a 40-page catalogue recently issued by the Blaw-Knox Company.

MALLEABLE IRON.—The American Malleable Castings Association, Cleveland, O., has prepared a short treatise on malleable iron, explaining its structure, uses and treatment, and indicating a few of the principles on which the process of making malleable iron castings is based, as well as some of the results that have been attained. The booklet is illustrated with a number of photographs showing results of various kinds of tests to determine the strength of the material.

CENTRIFUGAL PUMP SALES SERVICE DATA.—A large amount of information on the theory, design and testing of centrifugal pumps, originally sent out in the form of sales letters to its own men, has been compiled by the Goulds Manufacturing Company, Seneca, N. Y., into Bulletin No. 122. There are 18 chapters dealing with methods of use, characteristics, effects of changes, performances, proper installation and operation, etc., with illustrations and a considerable number of data curves.

STANDARD LOCOMOTIVES.—The Locomotive Superheater Company, New York, has compiled and published in Bulletin No. 7, general arrangement drawings and details of construction, together with a photograph and general data for each of the 12 types of standard locomotives designed by the United States Railroad Administration. Wheel loading and clearance diagrams for each are also given, making it a convenient reference book for information pertaining to the stadard locomotives.

CUTTERS.—The Cleveland Milling Machine Company, Cleveland, Ohio, has revised its list of cutters in Catalogue B. This catalogue contains 140 pages, giving standard sizes and prices, and illustrating the line of tools, such as cutters, end mills, collets, hobs, etc., made by this company. Many valuable tables are contained in the catalogue, including tables of cutting speeds, correspondinb diametral and circular pitches, decimal and millimeter equivalents, drill size decimal equivalents, screw threads and spur gear tooth spacing and thickness.

INDUSTRIAL MANAGEMENT.—L. V. Estes, Incorporated, industrial engineers, Chicago, have published a small booklet entitled Human Relations in Industry, for the purpose of pointing out the underlying principles of personal relations and industrial management that are essential to industrial harmony and maximum production. It contains a statement showing the trend of present conditions and the need for definite action by employers, and outlines in a general way the procedure necessary for putting in effect plans tending toward a betterment of human relations in industry.

AIR HOISTS AND ELEVATORS.—Catalogue No. 149, issued by the Whiting Foundry Equipment Company, Harvey, Ill., is devoted to the description of pneumatic and hydro-pneumatic hoisting equipment. The air hoists include both the vertical and horizontal type, these designs being made in two different styles, the one for ordinary service, the other for use where delicate control is necessary. The accessories described include special valves to stop the hoists at any point on the upward stroke or to maintain the load at any desired height, and also trolleys for use where unusually long hose is required. The compressed air elevators are intended for one-story lifts only and have capacities up to 6,000 lb.

Financial and Construction

Railway Financial News

BOSTON & MAINE.—At an adjourned meeting of stockholders on December 3 the following directors were elected: Norman L. Bassett, Augusta, Me.; Richard Billings, Woodstock, Vt.; Charles W. Bosworth, Springfield, Mass.; Frank P. Carpenter, Manchester, N. H.; Charles Sumner Cook, Portland, Me.; Henry B. Day, Newton, Mass.; James L. Doherty, Springfield, Mass.; Charles P. Hall, Newton, Mass.; Woodward Hudson, Concord, Mass.; Benjamin A. Kimball, Concord, N. H.; George von L. Meyer, Hamilton, Mass.; Walter M. Parker, Manchester, N. H.; Jarvis P. O'Brien, Troy, N. Y.; J. Duncan Upham, Claremont, N. H.; George R. Wallace, Fitchburg, Mass.; Henry E. Warner, Lincoln, Mass.

The new members represent the new first preferred stock given to the leased lines and the old preferred stock.

Samuel Carr, F. C. Dumane and J. M. Prendergast, who have served on the board of many years, desired to be relieved from further service. It is expected that James H. Hustis will resume his position as president as soon as he can settle the matters of the receivership.

LEHIGH VALLEY.—This company has declared the regular quarterly dividend of 1¾ per cent on the common stock, payable to stockholders of record December 13 on or soon after January 3 as the company receives from the government an adequate payment of the rental now due. The regular quarterly dividend of 2½ per cent on the preferred stock was also declared, payable January 3 to stockholders of record December 13. This is same rate as declared on the common stock three and six months ago.

WICHITA & NORTHWESTERN.—This road has applied to the Kansas Public Utilities Commission for permission to issue $9,000,000 in securities for the purchase of railroad property and for railroad construction. According to the statement filed with the commission, the roads intend to take over the Anthony & Northern, purchase the Iuka branch of the Missouri Pacific and construct a line from Wichita, Kans., to Olcott.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This road will construct a one-story, steel frame, car repair shop, 50 ft. by 128 ft., at Chicago. The cost is estimated at approximately $10,000.

CHICAGO UNION STATION COMPANY.—A contract for the erection of the Harrison street viaduct has been given to the Kelly-Atkinson Construction Company, Chicago, at a figure of $206,000.

EASTLAND, WICHITA FALLS & GULF.—The company has 15 miles of road graded ready for ties and rails, from Mangum, Texas, on the Central branch of the Missouri, Kansas & Texas, through Eastland, to the Eastland and Stephens county line north. Contracts have been let for grading an additional nine miles to Wayland in Stephens county. It is expected that all the track will be laid and the line opened for operation by April, 1920. O. B. Colquit, president, Dallas, Texas.

THE COST OF THE GREAT WAR was $337,946,179,657, according to an estimate made by Ernest L. Bogart, professor of economics at the University of Illinois.

PASSENGER TRAFFIC IN JULY.—The number of passengers carried one mile in July was 4,535,725,858, an increase of 12.4 per cent over July, 1918, according to the monthly report of the Operating Statistics Section. In the Northwestern region the increase was 23.8 per cent, while in the Ohio-Indiana district and the Southern region there were decreases. For the seven months ending July 31 the number of passengers carried one mile was 25,856,907, an increase of 5.9 per cent.

EDITORIAL

Railway Age

Table of Contents will be found on Page 5 of the Advertising Section

Universities, colleges, technical schools and other institutions of learning largely dependent on the more or less fixed returns from investments, are feeling seriously the effects of advancing costs of operation and many of them are making appeals to the public to avoid the only other alternate—curtailed scope. These appeals should meet with a generous response. The railroads and industries in general are to a large extent dependent upon the technical schools. It is to the technically trained men that business must look for the perfecting of mechanical devices, scientific investigations, etc. Any loss of efficiency in the schools must surely be followed by a corresponding let down in the efficiency of the various organizations dependent for advancement on the work of the technically trained men in their employ. For these reasons the appeals must not fall on deaf ears. The railroads in particular cannot, from a purely selfish viewpoint, view these calls with indifference. Taken collectively they, perhaps, employ more technically trained men than any other single industry. The engineering, the mechanical, and the electrical departments of the roads must necessarily look to the technical schools as the source of supply in recruiting forces. To these departments the recruiting of high grade technical men is as necessary as securing an adequate appropriation.

More Funds for the Universities

Many of those prominently connected with commerce and industry wish to see propaganda against the Plumb plan carried on with energy as they believe that the agitation for it is a menace, first, to private ownership of railroads, and, second, to private ownership of property of all kinds. But the real danger at present to private ownership and management of railroads is not the Plumb plan. It stands no chance of early adoption, and probably no real chance of adoption at any time. The greatest danger to private ownership and management of railroads comes from those who profess to be, and who really are, in favor of that policy, but who are unwilling to support the demand for the kind of legislation and regulation which are indispensable to the success of private management. Ten years ago Judge C. A. Prouty said, in an address at Yale University: "If we are ever brought face to face with the proposition of government ownership it will not be by the imposition of excessive charges, for we can deal with that situation, but by the impossibility of obtaining adequate facilities. * * * If we are to look in the future as in the past to private capital for the providing of our railroad transportation, it is fundamentally necessary that confidence in the fair treatment of that capital shall be established." The only way in which confidence in the fair treatment of private capital invested in railroads can be established is by Congress in its law-making capacity, and the regulating bodies in their administrative capacity, providing for the railways to be allowed and enabled to earn a return sufficient to enable them to pay approximately the same return upon capital which is paid by other large and equally well managed concerns. A large part of those who say they favor, and really do favor, private management are today either opposing legislation to require that the railways shall be allowed to earn sufficient to enable them adequately to develop their facilities or are giving such legislation either lukewarm or no support. It is high time that those who believe private management will be best for the commerce, the industry, and the people of the United States should clarify their minds upon this subject and begin vigorously to promote action in accordance with their professed principles.

Greatest Danger to Private Management

Discussions of the railroad question such as that at the recent meeting of the Academy of Political Science in New York, are of great value in promoting thought among the general public about the great economic problems involved. It is always a question, however, as to how far it is possible to expect such a discussion to throw new light on a tremendously complicated and technical matter. Men of all shades of opinion participated in the discussion, but for this very reason they did not talk the same language. A man like John E. Oldham, the Boston banker, who has made a life-long study of the railroad problem, would have had to spend days, not hours, in giving his audience a preliminary knowledge of the facts involved, were he to have discussed the subject in the full possibilities of his own technical knowledge. On the other hand, most men called on to discuss such a question before a general audience, feel that a certain amount of old ground must be gone over as a foundation for what new suggestions they have to make. But the going over of old ground in a non-technical way is not without its value, especially to the speaker himself. Trying to put into non-technical words, what he knows and thinks about the situation, tends to clarify the mind of a man, no matter how thoroughly familiar he is with his subject. To have a proposition stated, a fact made concrete, by way of illustration, is a contribution to the solving of a complicated problem. Even if, therefore, no startlingly new suggestions were made at the meeting of the Academy of Political Science, the re-statement in non-technical terms of various phases of the railroad question was of real value.

Technical, But Not Too Technical

Within a few weeks the Bureau of Standards, Washington, D. C., expects to adopt and publish revised rules and regulations of at least a portion of its "National Electrical Code." Of particular interest to the railroads is that portion of the code which relates to signal lines crossing over railways. The term "signal lines" here referred to should not be confused with the facilities applied to railway signal department appliances, but should be considered as that general class of wire lines operating below a certain stated voltage used mainly for some form of communication.

The crossing of wire lines over the tracks of railways has always been a matter of considerable importance and in the past it has been somewhat of a task to get some of the wire owning companies to install crossings provided with ample

Signal Lines Crossing Over Railways